

حمل الآن

مجانا وحصريا

امتحانات رقم (1)

الترم الاول



Algebra 2025

30
Marks

Model (1)

9

1 Choose the correct answer:

- a** If all individuals are equal, then $(x = 0, \text{mode} = 0, \bar{x} = 0, \sigma = 0)$
- b** If $\frac{a + 2b}{a - b} = \frac{2}{3}$, then $\frac{a}{b} = \dots\dots\dots$. $(-8, -\frac{1}{8}, -1, 8)$
- c** If $X = \{5, 1\}$ and $Y = \{3, 4, 7\}$, then $(3, 4) \in \dots\dots\dots$. $(X \times Y, X^2, Y \times X, Y^2)$
- d** If $x = \{6, 8\}$, then $n(x \times \emptyset) = \dots\dots\dots$. $(\emptyset, 0, 1, 2)$
- e** $\frac{4}{x} = \frac{7}{y} = \frac{m}{y - x}$, then $m = \dots\dots\dots$. $(10, -3, 3, 7)$
- f** The standard deviation for the values 7, 7, 7 is $(0, 5, 1, 2)$
- g** If $y = \frac{m}{x^2}$, where m is constant $\neq 0$, then $y \propto \dots\dots\dots$. $(\frac{1}{x^2}, -\frac{1}{y^2}, \frac{1}{x}, y^2)$
- h** The function $f(x) = x^3 - x^2 + 2x$ is a polynomial of degree. (fourth, second, third, first)
- i** If the arithmetic mean of the values: $x, 7, 8, 5, 6$ is 6, then $x = \dots\dots\dots$. $(4, 2, 5, 9)$

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2 Answer each of the following:

- a** If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, find:

1. $X \times Z$

2. $n(X \times Z)$

3. $(Y \cap X) \times (X - Y)$

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- b** If $\frac{x - 2y}{x + 3y} = \frac{1}{2}$, find the value of $\frac{x}{y}$.

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- c** Calculate the mean and the standard deviation of the following values: 8, 9, 7, 6, 5

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d If $Y \propto X$ and $Y = 6$ when $X = 3$, find:

1- The relation between Y and X

2- The value of y when $X = 5$

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e If y is the middle proportional between x and z , prove that: $\frac{x}{z} = \frac{y^2}{z^2}$

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f If $X = \{4, 9, 16\}$, $Y = \{1, 2, 3, 4, 5\}$ and R is a relation from X to Y where " $a R b$ " means " $a = b^2$ " for each $a \in X$, $b \in Y$.

1- Write R and represent it by an arrow diagram.

2- Show that R is a function and find its range.

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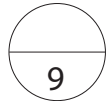
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g If $x - 3y = 0$, then prove that $x \propto y$.

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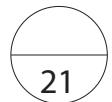
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1 Choose the correct answer:

- a If $X = \{7\}$, then $n(X^2) = \dots\dots\dots$. (49 , 7 , 1 , 2)
- b $\frac{9}{y} = \frac{12}{y} = \frac{m}{y-x}$, then $m = \dots\dots\dots$. (10 , -3 , 3 , 7)
- c The most common value of set of individuals is called $\dots\dots\dots$.
(mean , mode , range , median)
- d The positive middle proportional between a and b is $\dots\dots\dots$.
(\sqrt{ab} , ab , $-\sqrt{ab}$, $\pm\sqrt{ab}$)
- e If $a > 5$, then the point $(5, a - 5)$ lies in the $\dots\dots\dots$ quadrant.
(1st , 2nd , 3rd , 4th)
- f If the curve that represents the function $f(x) = x^2 + c$, passes through the point $(0, 3)$, then $c = \dots\dots\dots$. (3 , 2 , 5 , 0)
- g $y \propto \frac{1}{\sqrt{x}}$, then x varies $\dots\dots$ (inversely as y^2 , directly as y , directly as y^2 , inversely as y)
- h The positive square root of the average of squares of deviations of the values from their mean is called $\dots\dots\dots$. (the standard deviation , mode , mean , median)
- i The vertex of the curve that represents the function $f(x) = 2x^2 - 4x + 5$ is $\dots\dots\dots$.
((1,3) , (3, 1) , (2, 4) , (1,5))

2 Answer each of the following:



- a If $(x + 1, 9) = (5, 3y)$, then find the value of x and y .

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- b If $\frac{x}{y} = \frac{1}{2}$, then find the value of $\frac{2x + y}{3y - x}$.

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- c The following frequency distribution shows the ages of 10 children:

Age in year	5	8	9	10	12	Total
Number of children	1	2	3	3	1	10

Calculate the standard deviation of the ages in years.

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- d If $X = \{1, 2, 3\}$, $Y = \{3, 4\}$, find:

$$1 - (Y \cap X) \times Y$$

$$2 - n(X^2)$$

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- e If $\frac{x}{y} = \frac{2}{5}$, find the value of $\frac{3x - y}{2y - 3x}$.

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- f If $y \propto x$ and $y = 7$, at $x = 14$, find:

1- The relation between y and x

2- The value of y at $x = 12$

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- g If $y \propto x$, and $y = 9$ as $x = 3$, then find the relation between y and x .

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1 Choose the correct answer:

- a If $\sum(x - \bar{x})^2 = 12$ for the set of 3 values, then $\sigma = \dots\dots\dots$. (12, 4, 2, 3)
- b The mean of the values 10, 4, 5, 6, 5 is $\dots\dots\dots$. (10, 6, 12, 5)
- c If a, b, 5 and 7 are proportional, then $\frac{a}{b} = \dots\dots\dots$. ($\frac{7}{5}$, $\frac{5}{7}$, 5, 7)
- d If $2x = 7y$, then $(\frac{x}{y})^{-1} = \dots\dots\dots$. ($\frac{2}{7}$, $\frac{7}{2}$, 2, 7)
- e The set of images of each element of the domain of the function is called the $\dots\dots\dots$
(domain, codomain, rule, range)
- f If $f(x) = kx - 6$ and $f(3) = 6$, then $k = \dots\dots\dots$. (4, 7, 16, -4)
- g If y varies inversely as x and $x = \sqrt{3}$, when $y = \frac{2}{\sqrt{3}}$, then the proportional constant = $\dots\dots\dots$. (3, 1, 2, 12)
- h The difference between the greatest and smallest value is called $\dots\dots\dots$.
(range, median, domain, codomain)
- i $x - 3y = 0$, then $x \propto \dots\dots\dots$. (x, 3, y, 0)

2 Answer each of the following:

- a Calculate the mean and the standard deviation for the following frequency distribution:

Sets	0-	4-	8	12-	16-20	Total
Frequency	3	4	7	2	9	25

Calculate the standard deviation of the ages in years.

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- b** Represent graphically the function $f(x) = x^2 + 2x + 1$, where $x \in [-4, 2]$ and from the graph identify:

- 1** The vertex of the curve
- 2** The equation of the axis of symmetry
- 3** The maximum or minimum value

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- c** If $Y \propto X$ and $Y = 7$ when $X = 42$, find:

- 1** The relation between Y and X

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- 2** The value of Y as $X = 60$

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d If $(x^3 - 1, 4) = (7, y)$, find the value of: $4x - y$

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e If $X = \{1, 4, 6\}$, $y = \{5, 3\}$

Find: **1** $n(X \times Y)$

2 $Y \times X$

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f If $f(x) = 2x + b$, and $f(3) = 10$, find the value of b , then find $f(0.5)$

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g If the range of values $2, 7, x, 6$ is 8 where $x > 0$, then find the value of x .

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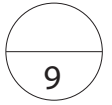
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Geometry 2025

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Marks

Model (1)



1 Choose the correct answer:

- a $\tan 60^\circ = \dots\dots\dots$. $(\sqrt{3} , \frac{1}{2} , \frac{1}{\sqrt{2}} , \sqrt{2})$
- b If $\sin x = \frac{1}{2}$, where x is an acute angle, then $m(\angle x) = \dots\dots\dots^\circ$. $(45 , 60 , 30 , 90)$
- c If $A(0, 0)$, $B(5, 7)$ and $C(5, h)$ are the vertices of a right-angled triangle at C ,
then $h = \dots\dots\dots$ $(5 , 0 , 7 , -5)$
- d If the two straight lines $3x - 4y - 3 = 0$ and $ky + 3x - 8 = 0$ are perpendicular,
then $k = \dots\dots\dots$ $(-4 , 3 , -3 , \frac{9}{4})$
- e A circle with its center at the origin point and a radius of 2 units length. Which of the
following points belongs to the circle? $((1, \sqrt{3}) , (\sqrt{3}, 1) , (3, 1) , (1, 2))$
- f The slope of the straight line which passes through the points $(2, 4)$
and $(3, 8)$ is $\dots\dots\dots$ $(4 , -4 , 2 , 8)$
- g ABC is a right-angled triangle at A , $\tan B = 1$, then $\tan C - \sin C \cos C = \dots\dots\dots$.
 $(\frac{1}{2} , \frac{\sqrt{3}}{2} , 1 , 2)$
- h $3 \cos 30^\circ = \dots\dots\dots$. $(\frac{3\sqrt{3}}{2} , \frac{\sqrt{3}}{2} , \frac{1}{2} , 1)$
- i If the two straight lines $3x - 4y - 3 = 0$ and $ny + 3x - 8 = 0$ are parallel,
then $n = \dots\dots\dots$ $(-4 , -\frac{8}{3} , 4 , \frac{2}{3})$

2 Answer each of the following:

a $\cos^2 45^\circ \tan^2 60^\circ - \sin^2 60^\circ \sin^2 30^\circ$

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b Find the length of \overline{AB} in the following case:

$A(2, 2)$, $B(5, -1)$

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c Prove that the points $A(-2, 7)$, $B(-3, 4)$ and $C(1, 16)$ are collinear.

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d Find the equation of the straight line which passes through the point $(1, 3)$ and is parallel to the straight line whose slope equals 3.

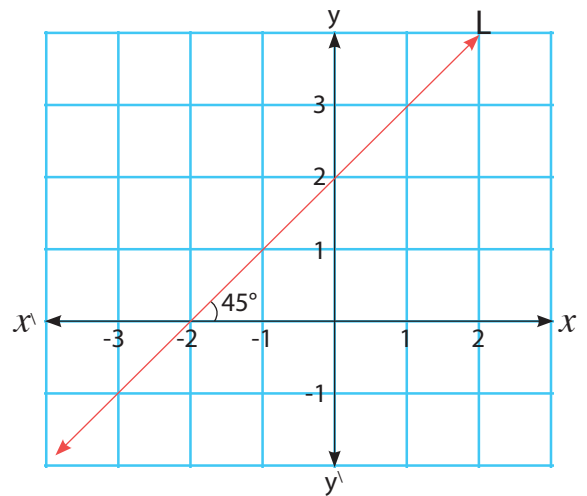
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e From the opposite figure, find:

- 1 The slope of the straight line L
- 2 The length of the y-intercept
- 3 The equation of the straight line L



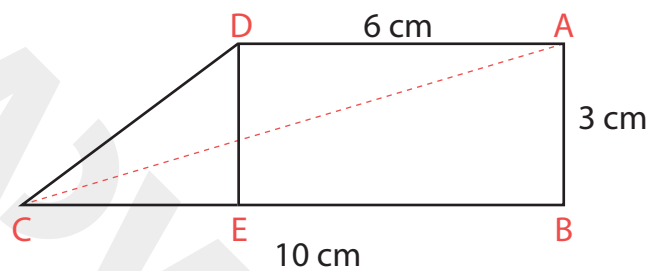
f If ABCD is a trapezium,

$$\overline{AD} \parallel \overline{BC}, m(\angle B) = 90^\circ,$$

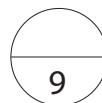
$$AB = 3 \text{ cm}, AD = 6 \text{ cm},$$

$$\text{and } BC = 10 \text{ cm},$$

$$\text{prove that: } \cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$$



g If the two straight lines $x + y = 5$ and $kx + 2y = 0$ are parallel, then find the value of k .



1 Choose the correct answer:

- a The distance between the point $(4, -3)$ and the X-axis equals units.

(3 , 4 , -3 , 5)

- b If the straight line $y = (a - 1)x + 5$ is parallel to the straight line that is passing through the two points $(1, 2)$ and $(3, 8)$, then $a =$

(3 , 4 , -4 , 7)

- c In triangle ABC, if $\sin A = \cos B$, then triangle ABC is a/an-angled triangle.

(acute , obtuse , right , reflexed)

- d ABC is a right-angled triangle at B where $3 AC = 5 BC$, then $\tan A =$

($\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{5}$, $\frac{4}{5}$)

- e $\tan(45^\circ) =$

(1 , $\sqrt{3}$, $\sqrt{2}$, $\frac{1}{\sqrt{2}}$)

- f If $x = \sin 60^\circ \tan 45^\circ$, then $x^2 =$

($\frac{1}{3}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$)

- g If the two straight lines $3x - 4y - 7 = 0$ and $my + 3x = 3$ are perpendicular, then the value of $m =$

($\frac{9}{4}$, $\frac{1}{3}$, $\frac{5}{2}$, $\frac{4}{3}$)

- h If $(3, -4)$ is the midpoint of \overline{AB} where $A(1, 2)$, then the coordinates of B is

($(5, -10)$, $(-10, 5)$, $(2, 5)$, $(5, 2)$)

- i The equation of the straight line which passes through the point $(7, -2)$ and is parallel to X-axis is

($x = 2$, $y = -2$, $y = 2$, $x = 1$)

2 Answer each of the following:

- a** Prove that: the straight line L_1 which passes through the two points $(-1, 4)$ and $(3, 7)$ is perpendicular to the straight line L_2 which passes through the two points $(1, 1)$ and $(4, -3)$.

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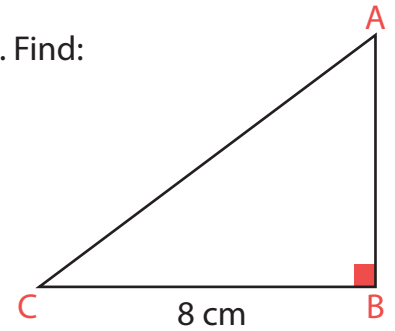
- b** ABC is a right-angled triangle at B, $BC = 8 \text{ cm}$, $\tan C = \frac{3}{4}$. Find:

- 1** The length of each of \overline{AB} and \overline{AC}

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- 2** $\sin^2 A + \cos^2 A$

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- c** If $12 \tan^2 \theta = 16 \sin^2 30^\circ + 32 \cos^2 60^\circ$, find θ .

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- d Prove that the points A (−1 , 1) , B (0 , 5) , C (4 , 2) and D (5 , 6) are the vertices of a parallelogram.

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- e Find the equation of the straight line which passes through the point (4 , −5) and is perpendicular to the straight line $2x + y - 7 = 0$.

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- f If C (4 , 2) is the midpoint of \overline{AB} if A (2 , 4), find the coordinates of the point B.

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- g If $\cos x = \frac{\sqrt{3}}{2}$ where x is an acute angle, then find the value of $\sin 2x$.

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1 Choose the correct answer:

- a If $\tan (2x - 5) = 1$ where x is the measure of an acute angle, then $x =$
(25° , 35° , 45° , 55°)
- b If the slope of the straight line $y + ax + b = 0$ is -3 and passes through $(1, 4)$,
then $a + b =$ (7 , -7 , 4 , -4)
- c If $\frac{-3}{2}, \frac{6}{m}$ are slopes of two parallel straight lines, then $m =$
(4 , 6 , -4 , 2)
- d If A, B are two supplementary angles and $m(\angle A) = m(\angle B)$, then $m(\angle B) =$
(180 , 90 , 45 , 30)
- e If a straight line is parallel to y -axis and passes through points $C(k, 4), D(-5, 7)$,
then $k =$ (6 , 3 , 5 , -5)
- f The slope of the straight line which makes an angle of measure 45° with the positive
direction of X -axis is (1 , 2 , 0.5 , 3)
- g If $\sin 2x = 0.5$, where x is the measure of an acute angle, then $x =$
(15 , 20 , 60 , 30)
- h If ABC is a right-angled triangle at B and $\sin A = \frac{1}{2}$, then $\cos C =$
(1 , $\frac{1}{2}$, $\frac{\sqrt{3}}{2}$, $\frac{\sqrt{3}}{4}$)
- i The equation of the straight line passing through the origin point and its slope $= 3$ is
($y = 3x$, $x = 3y$, $y = 5x$, $y = x$)

2 Answer each of the following:

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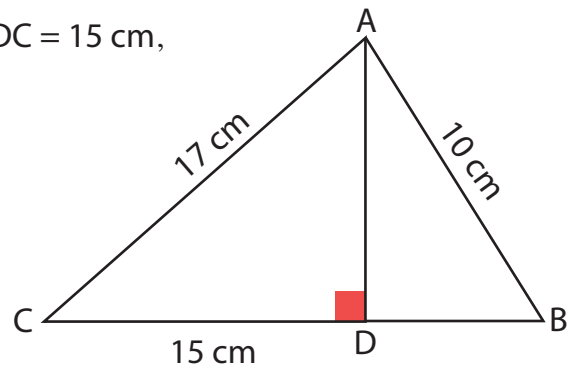
- a Find the value of x if: $\tan x = \frac{\sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ}{\sin 45^\circ \cos 60^\circ + \sin 45^\circ \sin 60^\circ}$

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- b In the opposite figure: $\overline{AD} \perp \overline{BC}$, $AC = 17$ cm, $DC = 15$ cm, $AB = 10$ cm, find the value of:
 $17 \sin (\angle C) + 5 \cos (\angle B)$



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- c Find the equation of the straight line whose slope is 7 and intercepts from the positive part of y-axis 4 length units.

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- d Prove that the points $A(4, 3)$, $B(1, 1)$ and $C(-5, -3)$ are collinear.

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- e Find the equation of the straight line which passes through the point $(9, 2)$ and is parallel to the straight line: $2y = -8x + 4$

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- f Without using calculator, prove that: $\sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$

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- g The straight line whose equation is $5y = 10x - 15$, find:

1 Its slope.

2 The intercept part of y-axis.

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1 Choose the correct answer:

- a If all individuals are equal, then ($x = 0$, mode = 0, $\bar{x} = 0$, $\sigma = 0$)
- b If $\frac{a + 2b}{a - b} = \frac{2}{3}$, then $\frac{a}{b} = \dots\dots\dots$. (-8 , $-\frac{1}{8}$, -1 , 8)
- c If $X = \{5, 1\}$ and $Y = \{3, 4, 7\}$, then $(3, 4) \in \dots\dots\dots$. ($X \times Y$, X^2 , $Y \times X$, Y^2)
- d If $x = \{6, 8\}$, then $n(x \times \emptyset) = \dots\dots\dots$. (\emptyset , 0 , 1 , 2)
- e $\frac{4}{x} = \frac{7}{y} = \frac{m}{y - x}$, then $m = \dots\dots\dots$. (10 , -3 , 3 , 7)
- f The standard deviation for the values $7, 7, 7$ is (0 , 5 , 1 , 2)
- g If $y = \frac{m}{x^2}$, where m is constant $\neq 0$, then $y \propto \dots\dots\dots$. ($\frac{1}{x^2}$, $-\frac{1}{y^2}$, $\frac{1}{x}$, y^2)
- h The function $f(x) = x^3 - x^2 + 2x$ is a polynomial of degree. (fourth, second, **third**, first)
- i If the arithmetic mean of the values: $x, 7, 8, 5, 6$ is 6 , then $x = \dots\dots\dots$. (4 , 2 , 5 , 9)

2 Answer each of the following:

- a If $X = \{1, 4, 7\}$, $Y = \{4\}$, $Z = \{3, 7\}$, find:
- $X \times Z$
 - $n(X \times Z)$
 - $(Y \cap X) \times (X - Y)$
1. $X \times Z = \{1, 4, 7\} \times \{3, 7\} = \{(1, 3), (1, 7), (4, 3), (4, 7), (7, 3), (7, 7)\}$
2. $n(X \times Z) = 3 \times 2 = 6$
3. $(Y \cap X) \times (X - Y) = \{4\} \times \{1, 7\} = \{(4, 1), (4, 7)\}$
- b If $\frac{x - 2y}{x + 3y} = \frac{1}{2}$, find the value of $\frac{x}{y}$:
- $x + 3y = 2x - 4y$
- $3y + 4y = 2x - x$
- $7y = x \quad \frac{x}{y} = 7$
- c Calculate the mean and the standard deviation of the following values: $8, 9, 7, 6, 5$

The mean of the values $\bar{x} = \frac{\sum x}{n} = \frac{8 + 9 + 7 + 6 + 5}{5} = 7$

x	$x - \bar{x}$	$(x - \bar{x})^2$
8	$8 - 7 = 1$	1
9	$9 - 7 = 2$	4
7	$7 - 7 = 0$	0
6	$6 - 7 = -1$	1
5	$5 - 7 = -2$	4
Total		10

The standard deviation $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} = \sqrt{\frac{10}{5}} = 1.41$

- d** If $Y \propto X$ and $Y = 6$ when $X = 3$, find:

1- The relation between Y and X

2- The value of y when $X = 5$

$$\therefore Y \propto X$$

$$\therefore Y = mX$$

$$\therefore Y = 6 \text{ when } X = 3$$

$$\therefore 6 = m \times 3$$

$$\therefore m = 2$$

The relation is: $Y = 2X$

when $X = 5$

$$\therefore Y = 2 \times 5 = 10$$

$$\therefore Y = 10$$

- e** If y is the middle proportional between x and z , prove that: $\frac{x}{z} = \frac{y^2}{z^2}$

$\therefore y$ is the middle proportional between x and z

$$\therefore \frac{x}{y} = \frac{y}{z} = m, y = zm, x = zm^2$$

$$\text{L.H.S} = \frac{x}{z} = \frac{zm^2}{z} = m^2$$

$$\text{R.H.S} = \frac{y^2}{z^2} = \frac{z^2 m^2}{z^2} = m^2$$

$$\therefore \frac{x}{z} = \frac{y^2}{z^2}$$

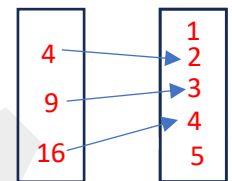
- f** If $X = \{4, 9, 16\}$, $Y = \{1, 2, 3, 4, 5\}$ and R is a relation from X to Y where " $a R b$ " means " $a = b^2$ " for each $a \in X, b \in Y$.

1- Write R and represent it by an arrow diagram.

2- Show that R is a function and find its range.

$$R = \{(4, 2), (9, 3), (16, 4)\}$$

R is a function because each element in X has one image in Y and its range = $\{2, 3, 4\}$



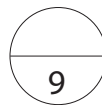
- g** If $x - 3y = 0$, then prove that $x \propto y$.

$$\therefore x - 3y = 0$$

$$\therefore x = 3y$$

$$\therefore \frac{x}{y} = 3$$

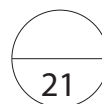
$$\therefore x \propto y$$



1 Choose the correct answer:

- a If $X = \{7\}$, then $n(X^2) = \dots\dots\dots$. (49 , 7 , **1** , 2)
- b $\frac{9}{y} = \frac{12}{y} = \frac{m}{y-x}$, then $m = \dots\dots\dots$. (10 , -3 , **3** , 7)
- c The most common value of set of individuals is called $\dots\dots\dots$.
(mean , **mode** , range , median)
- d The positive middle proportional between a and b is $\dots\dots\dots$.
(**\sqrt{ab}** , ab , $-\sqrt{ab}$, $\pm\sqrt{ab}$)
- e If $a > 5$, then the point $(5, a - 5)$ lies in the $\dots\dots\dots$ quadrant.
(**1st** , 2nd , 3rd , 4th)
- f If the curve that represents the function $f(x) = x^2 + c$, passes through the point $(0, 3)$, then $c = \dots\dots\dots$. (**3** , 2 , 5 , 0)
- g $y \propto \frac{1}{\sqrt{x}}$, then x varies $\dots\dots$ (**inversely as y^2** , directly as y , directly as y^2 , inversely as y)
- h The positive square root of the average of squares of deviations of the values from their mean is called $\dots\dots\dots$. (**the standard deviation** , mode , mean , median)
- i The vertex of the curve that represents the function $f(x) = 2x^2 - 4x + 5$ is $\dots\dots\dots$. (**(1,3)** , (3, 1) , (2, 4) , (1,5))

2 Answer each of the following:



- a If $(x + 1, 9) = (5, 3y)$, then find the value of x and y .

$$\therefore x + 1 = 5$$

$$\text{, then } x = 5 - 1 = 4 \text{ , } x = 4$$

$$\therefore 9 = 3y \text{ , then } y = 3$$

- b If $\frac{x}{y} = \frac{1}{2}$, then find the value of $\frac{2x + y}{3y - x}$.

$$\frac{x}{y} = \frac{1}{2} \text{ , then } x = m \text{ and } y = 2m$$

$$\frac{2x + y}{3y - x} = \frac{2m + 2m}{6m - m} =$$

$$\frac{4m}{5m} = \frac{4}{5}$$

- c The following frequency distribution shows the ages of 10 children:

Age in year	5	8	9	10	12	Total
Number of children	1	2	3	3	1	10

Calculate the standard deviation of the ages in years.

We find the mean of the ages using the table:

Age (x)	Number of children (k)	$x \times k$
5	1	5
8	2	16
9	3	27
10	3	30
12	1	12
Total	10	90

The mean (\bar{x}) = $\frac{\sum x \times k}{\sum k} = 90 \div 10 = 9$

We form the table:

x	k	$x - \bar{x}$	$(x - \bar{x})^2$	$(x - \bar{x})^2 \times k$
5	1	5 - 9 = -4	16	16
8	2	8 - 9 = -1	1	2
9	3	9 - 9 = 0	0	0
10	3	10 - 9 = 1	1	3
12	1	12 - 9 = 3	9	9
Total	10			30

The standard deviation $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2 \times k}{n}} = \sqrt{\frac{30}{10}} = 1.7$ years.

- d If $X = \{1, 2, 3\}$, $Y = \{3, 4\}$, find:

$$1 - (Y \cap X) \times Y$$

$$2 - n(X^2)$$

$$1 - Y \cap X = \{3\}$$

$$\text{then, } (Y \cap X) \times Y = \{3\} \times \{3, 4\} = \{(3, 3), (3, 4)\}$$

$$2 - n(X^2) = 3 \times 3 = 9$$

- e If $\frac{x}{y} = \frac{2}{5}$, find the value of $\frac{3x - y}{2y - 3x}$.

$$\text{If } \frac{x}{y} = \frac{2}{5} \quad \therefore x = 2m, \quad y = 5m$$

$$\frac{3x - y}{2y - 3x} = \frac{3 \times 2m - 5m}{2 \times 5m - 3 \times 2m} = \frac{6m - 5m}{10m - 6m} = \frac{1}{4}$$

- f If $y \propto x$ and $y = 7$, at $x = 14$, find:

1- The relation between y and x

2- The value of y at $x = 12$

$$\text{If } y \propto x \quad \therefore y = mx$$

$$\therefore y = 7, \text{ at } x = 14 \quad \therefore 7 = m \times 14 \quad \therefore m = \frac{1}{2}$$

$$\text{The relation: } y = \frac{1}{2}x$$

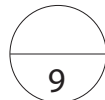
at $x = 12$:

$$y = \frac{1}{2} \times 12 \quad \therefore y = 6$$

- g If $y \propto x$, and $y = 9$ as $x = 3$, then find the relation between y and x .

$$\text{If } y \propto x \quad \therefore y = mx \quad \therefore 9 = m \times 3 \quad \therefore m = 3$$

$$\text{The relation: } y = 3x$$



1 Choose the correct answer:

- a If $\Sigma(x - \bar{x})^2 = 12$ for the set of 3 values, then $\sigma =$ (12 , 4 , **2** , 3)
- b The mean of the values 10 , 4 , 5 , 6 , 5 is (10 , **6** , 12 , 5)
- c If a , b , 5 and 7 are proportional, then $\frac{a}{b} =$ ($\frac{7}{5}$, $\frac{5}{7}$, 5 , 7)
- d If $2x = 7y$, then $(\frac{x}{y})^{-1} =$ ($\frac{2}{7}$, $\frac{7}{2}$, 2 , 7)
- e The set of images of each element of the domain of the function is called the
(domain , codomain , rule , **range**)
- f If $f(x) = kx - 6$ and $f(3) = 6$, then $k =$ (4 , 7 , 16 , -4)
- g If y varies inversely as x and $x = \sqrt{3}$, when $y = \frac{2}{\sqrt{3}}$, then the proportional constant = (3 , 1 , **2** , 12)
- h The difference between the greatest and smallest value is called
(**range** , median , domain , codomain)
- i $x - 3y = 0$, then $x \propto$ (x , 3 , **y** , 0)

2 Answer each of the following:



- a Calculate the mean and the standard deviation for the following frequency distribution:

Sets	0-	4-	8	12-	16-20	Total
Frequency	3	4	7	2	9	25

Calculate the standard deviation of the ages in years.

We find the mean of the ages using the table:

The center of the set = (lower limit + upper limit) \div 2

Sets	x	k	$x \times k$
0-	2	3	6
4-	6	4	24
8-	10	7	70
12-	14	2	28
16-20	18	9	162
Total		25	290

The mean $(\bar{x}) = \frac{\sum x \times k}{\sum k} = 290 \div 25 = 11.6$

We form the table:

x	k	$x - \bar{x}$	$(x - \bar{x})^2$	$(x - \bar{x})^2 \times k$
2	3	$2 - 11.6 = -9.6$	92.16	276.48
6	4	$6 - 11.6 = -5.6$	31.36	125.44
10	7	$10 - 11.6 = -1.6$	2.56	17.92
14	2	$14 - 11.6 = 2.4$	5.76	11.52
18	9	$18 - 11.6 = 6.4$	40.96	368.64
Total	25			800

The standard deviation $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2 \times k}{\sum k}} = \sqrt{\frac{800}{25}} = 5.7$

- b** Represent graphically the function $f(x) = x^2 + 2x + 1$, where $x \in [-4, 2]$ and from the graph identify:

- 1 The vertex of the curve
- 2 The equation of the axis of symmetry
- 3 The maximum or minimum value

x	-4	-3	-2	-1	0	1	2
$f(x)$	9	4	1	0	1	4	9

From the graph we find that :

- 1 The vertex of the curve is $(-1, 0)$
- 2 The equation of the line of symmetry is $x = -1$
- 3 The minimum value = 0

- c** If $Y \propto X$ and $Y = 7$ when $X = 42$, find:

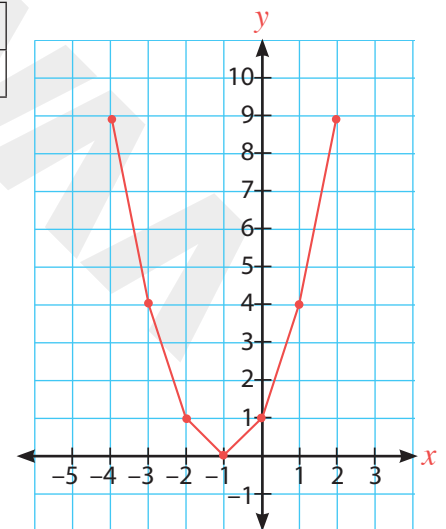
- 1 The relation between Y and X
- 2 The value of Y as $X = 60$

1 $\because Y \propto X \therefore Y = m X$

$\therefore 7 = 42 m$

$\therefore m = \frac{1}{6}$

$\therefore Y = \frac{1}{6}X$ (is the relation between X, Y)



2 $\therefore X = 60$

$\therefore Y = \frac{1}{6} \times 60 = 10$

- d** If $(x^3 - 1, 4) = (7, y)$, find the value of: $4x - y$

$\therefore (x^3 - 1, 4) = (7, y)$

$\therefore x^3 - 1 = 7 \quad \therefore x^3 = 8 \quad \therefore x = 2$

$y = 4,$

then $4x - y = 4 \times 2 - 4 = 4$

- e** If $X = \{1, 4, 6\}, y = \{5, 3\}$

Find: **1** $n(X \times Y)$

2 $Y \times X$

1 $n(X \times Y) = n(X) \times n(Y) = 3 \times 2 = 6$

2 $Y \times X = \{(5, 1), (5, 4), (5, 6), (3, 1), (3, 4), (3, 6)\}$

- f** If $f(x) = 2x + b$, and $f(3) = 10$, find the value of b , then find $f(0.5)$

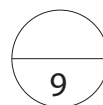
$\therefore f(3) = 10 \quad \therefore 10 = 2 \times 3 + b \quad \therefore b = 4$

$\therefore f(x) = 2x + 4$

$\therefore f(0.5) = 2 \times 0.5 + 4 = 5$

- g** If the range of values $2, 7, x, 6$ is 8 where $x > 0$, then find the value of x .

If the range is 8 , then $x - 2 = 8 \quad \therefore x = 8 + 2 = 10$



1 Choose the correct answer:

- a $\tan 60^\circ = \dots\dots\dots$. $(\sqrt{3}, \frac{1}{2}, \frac{1}{\sqrt{2}}, \sqrt{2})$
- b If $\sin x = \frac{1}{2}$, where x is an acute angle, then $m(\angle x) = \dots\dots\dots^\circ$. $(45, 60, 30, 90)$
- c If $A(0, 0)$, $B(5, 7)$ and $C(5, h)$ are the vertices of a right-angled triangle at C ,
then $h = \dots\dots\dots$ $(5, 0, 7, -5)$
- d If the two straight lines $3x - 4y - 3 = 0$ and $ky + 3x - 8 = 0$ are perpendicular,
then $k = \dots\dots\dots$ $(-4, 3, -3, \frac{9}{4})$
- e A circle with its center at the origin point and a radius of 2 units length. Which of the
following points belongs to the circle? $((1, \sqrt{3}), (\sqrt{3}, 1), (3, 1), (1, 2))$
- f The slope of the straight line which passes through the points $(2, 4)$
and $(3, 8)$ is $\dots\dots\dots$ $(4, -4, 2, 8)$
- g ABC is a right-angled triangle at A , $\tan B = 1$, then $\tan C - \sin C \cos C = \dots\dots\dots$.
 $(\frac{1}{2}, \frac{\sqrt{3}}{2}, 1, 2)$
- h $3 \cos 30^\circ = \dots\dots\dots$. $(\frac{3\sqrt{3}}{2}, \frac{\sqrt{3}}{2}, \frac{1}{2}, 1)$
- i If the two straight lines $3x - 4y - 3 = 0$ and $ny + 3x - 8 = 0$ are parallel,
then $n = \dots\dots\dots$ $(-4, -\frac{8}{3}, 4, \frac{2}{3})$

2 Answer each of the following:

a $\cos^2 45^\circ \tan^2 60^\circ - \sin^2 60^\circ \sin^2 30^\circ$

Answer

$$\begin{aligned} & \left(\frac{1}{\sqrt{2}}\right)^2 \times (\sqrt{3})^2 - \left(\frac{\sqrt{3}}{2}\right)^2 \times \left(\frac{1}{2}\right)^2 \\ &= \frac{1}{2} \times 3 - \frac{3}{4} \times \frac{1}{4} \\ &= \frac{3}{2} - \frac{3}{16} = \frac{21}{16} \end{aligned}$$

b Find the length of \overline{AB} in the following case:

$A(2, 2) \quad , \quad B(5, -1)$

Answer

$$\begin{aligned} \text{The length} &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ \text{The length} &= \sqrt{(5 - 2)^2 + (-1 - 2)^2} \\ &= \sqrt{9 + 9} = 3\sqrt{2} \text{ length unit} \end{aligned}$$

c Prove that the points $A(-2, 7)$, $B(-3, 4)$ and $C(1, 16)$ are collinear.

Answer

$$\text{The slope of } \overrightarrow{AB} = \frac{4 - 7}{-3 - (-2)} = \frac{-3}{-1} = 3$$

$$\text{The slope of } \overrightarrow{BC} = \frac{16 - 4}{1 - (-3)} = \frac{12}{4} = 3$$

$$\text{The slope of } \overrightarrow{AB} = \text{The slope of } \overrightarrow{BC}$$

The points A , B and C are collinear.

d Find the equation of the straight line which passes through the point $(1, 3)$ and is parallel to the straight line whose slope equals 3.

Answer

\therefore The slope of the straight line is 3

$$\therefore \text{ In the equation: } y = mx + c \qquad \therefore y = 3x + c$$

\therefore The straight line passes through the point $(1, 3)$

$$\therefore 3 = 3 \times 1 + c \qquad \therefore 3 = 3 + c$$

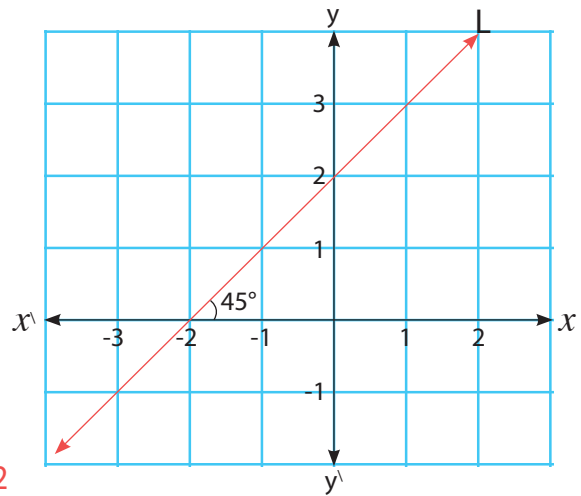
$$\therefore c = 0$$

\therefore The equation is: $y = 3x$

- e From the opposite figure, find:
- 1 The slope of the straight line L
 - 2 The length of the y-intercept
 - 3 The equation of the straight line L

Answer

- 1 The slope of the straight line L = $\tan 45^\circ = 1$
- 2 The length of the y-intercept = 2 units
- 3 The equation of the straight line L: $y = x + 2$



- f If ABCD is a trapezium, $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 3$ cm, $AD = 6$ cm, and $BC = 10$ cm, prove that: $\cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$

Answer

$$\therefore \overline{AD} \parallel \overline{BC}, \overline{AB} \perp \overline{BC}$$

$$\therefore \overline{DE} \perp \overline{BC}$$

\therefore ABED is a rectangle

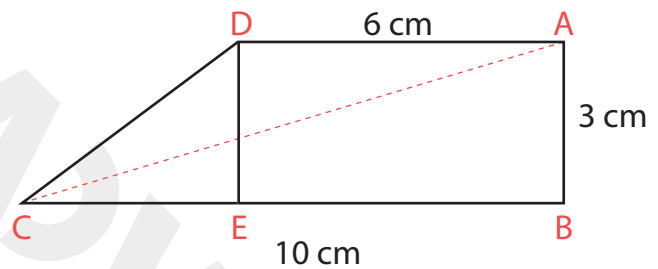
In $\triangle DEC$ is a right-angled triangle:

$$\therefore CE = 10 - 6 = 4 \text{ cm}, DE = 3 \text{ cm}$$

$$\therefore (DC)^2 = (3)^2 + (4)^2$$

$$\therefore DC = 5 \text{ cm} \quad \therefore \cos(\angle DCB) = \frac{4}{5}, \quad \tan(\angle ACB) = \frac{3}{10}$$

$$\therefore \cos(\angle DCB) - \tan(\angle ACB) = \frac{4}{5} - \frac{3}{10} = \frac{1}{2}$$



- g If the two straight lines $x + y = 5$ and $kx + 2y = 0$ are parallel, then find the value of k.

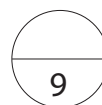
Answer

If the two straight lines are parallel, then their slopes are equal

$$\therefore -1 = \frac{-k}{2}$$

$$\therefore -2 = -k$$

$$\therefore k = 2$$



1 Choose the correct answer:

- a The distance between the point $(4, -3)$ and the X-axis equals units.

(3 , 4 , -3 , 5)

- b If the straight line $y = (a - 1)x + 5$ is parallel to the straight line that is passing through the two points $(1, 2)$ and $(3, 8)$, then $a =$

(3 , 4 , -4 , 7)

- c In triangle ABC, if $\sin A = \cos B$, then triangle ABC is a/an-angled triangle.

(acute , obtuse , right , reflexed)

- d ABC is a right-angled triangle at B where $3 AC = 5 BC$, then $\tan A =$

($\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{5}$, $\frac{4}{5}$)

- e $\tan(45^\circ) =$

(1 , $\sqrt{3}$, $\sqrt{2}$, $\frac{1}{\sqrt{2}}$)

- f If $x = \sin 60^\circ \tan 45^\circ$, then $x^2 =$

($\frac{1}{3}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$)

- g If the two straight lines $3x - 4y - 7 = 0$ and $my + 3x = 3$ are perpendicular, then the value of $m =$

($\frac{9}{4}$, $\frac{1}{3}$, $\frac{5}{2}$, $\frac{4}{3}$)

- h If $(3, -4)$ is the midpoint of \overline{AB} where $A(1, 2)$, then the coordinates of B is

((5, -10) , (-10, 5) , (2, 5) , (5, 2))

- i The equation of the straight line which passes through the point $(7, -2)$ and is parallel to X-axis is

($x = 2$, $y = -2$, $y = 2$, $x = 1$)

2 Answer each of the following:

- a Prove that: the straight line L_1 which passes through the two points $(-1, 4)$ and $(3, 7)$ is perpendicular to the straight line L_2 which passes through the two points $(1, 1)$ and $(4, -3)$.

Answer

$$\therefore \text{Slope of } L_1 = \frac{7-4}{3-(-1)} = \frac{3}{4}$$

$$\therefore \text{Slope of } L_2 = \frac{-3-1}{4-1} = \frac{-4}{3}$$

$$\therefore \text{Slope of } L_1 \times \text{Slope of } L_2 = \frac{3}{4} \times \frac{-4}{3} = -1$$

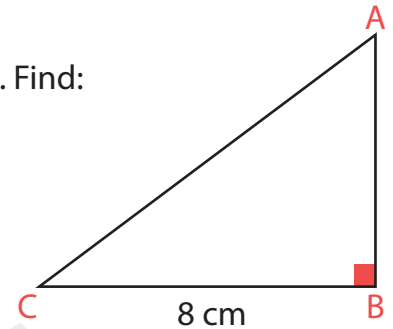
$$\therefore L_1 \perp L_2$$

- b ABC is a right-angled triangle at B, $BC = 8$ cm, $\tan C = \frac{3}{4}$. Find:

1 The length of each of \overline{AB} and \overline{AC}

2 $\sin^2 A + \cos^2 A$

Answer



1 $\tan C = \frac{3}{4}$

$$\frac{3}{4} = \frac{AB}{BC} \quad \frac{3}{4} = \frac{AB}{8}, \quad \text{then } AB = (3 \times 8) \div 4 = 6 \text{ cm}$$

$$AC = \sqrt{(AB)^2 + (BC)^2}, \quad AC = \sqrt{(6)^2 + (8)^2}, \quad \text{Then } AC = 10 \text{ cm}$$

2 $\sin^2 A + \cos^2 A = \left(\frac{8}{10}\right)^2 + \left(\frac{6}{10}\right)^2 = 1$

- c If $12 \tan^2 \theta = 16 \sin^2 30^\circ + 32 \cos^2 60^\circ$, find θ .

Answer

$$12 \tan^2 \theta = 16 \times \frac{1}{4} + 32 \times \frac{1}{4}$$

$$12 \tan^2 \theta = 4 + 8$$

$$12 \tan^2 \theta = 12, \quad \tan^2 \theta = 1, \quad \text{then } \theta = 45^\circ$$

- d Prove that the points A (−1 , 1) , B (0 , 5) , C (4 , 2) and D (5 , 6) are the vertices of a parallelogram.

Answer

$$\text{The midpoint of } \overline{AD} = \left(\frac{-1+5}{2}, \frac{1+6}{2} \right) = \left(2, \frac{7}{2} \right)$$

$$\text{The midpoint of } \overline{BC} = \left(\frac{0+4}{2}, \frac{5+2}{2} \right) = \left(2, \frac{7}{2} \right)$$

$$\text{The midpoint of } \overline{AD} = \text{The midpoint of } \overline{BC}$$

A , B , C and D are the vertices of a parallelogram.

- e Find the equation of the straight line which passes through the point (4 , −5) and is perpendicular to the straight line $2x + y - 7 = 0$.

Answer

∴ The straight line perpendicular to the straight line $2x + y - 7 = 0$

∴ The slope = $\frac{1}{2}$

∴ In the equation: $y = mx + c$ ∴ $y = \frac{1}{2}x + c$

∴ The straight line passes through the point (4 , −5)

∴ The equation: $-5 = \frac{1}{2} \times 4 + c$ ∴ $-5 = 2 + c$ ∴ $c = -7$

∴ The required equation: $y = \frac{1}{2}x - 7$

- f If C (4 , 2) is the midpoint of \overline{AB} if A (2 , 4), find the coordinates of the point B.

Answer

Suppose that B (x , y)

If C (4 , 2) is the midpoint of \overline{AB}

$$\therefore (4, 2) = \left(\frac{2+x}{2}, \frac{4+y}{2} \right)$$

$$\therefore 4 = \frac{2+x}{2}$$

$$\therefore 8 = 2 + x \quad \therefore x = 6$$

$$\therefore 2 = \frac{4+y}{2}$$

$$\therefore 4 = 4 + y \quad \therefore y = 0$$

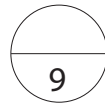
∴ The coordinates of the point B (6 , 0)

- g If $\cos x = \frac{\sqrt{3}}{2}$ where x is an acute angle, then find the value of $\sin 2x$.

Answer

$$\text{If } \cos x = \frac{\sqrt{3}}{2} \quad \therefore x = 30^\circ$$

$$\therefore \sin 2x = \sin (30^\circ \times 2) = \sin 60^\circ = \frac{\sqrt{3}}{2}$$



1 Choose the correct answer:

a If $\tan (2x - 5) = 1$ where x is the measure of an acute angle, then $x =$

(25° , 35° , 45° , 55°)

b If the slope of the straight line $y + ax + b = 0$ is -3 and passes through $(1, 4)$,

then $a + b =$ (7 , -7 , 4 , -4)

c If $\frac{-3}{2}, \frac{6}{m}$ are slopes of two parallel straight lines, then $m =$

(4 , 6 , -4 , 2)

d If A, B are two supplementary angles and $m(\angle A) = m(\angle B)$, then $m(\angle B) =$

(180 , 90 , 45 , 30)

e If a straight line is parallel to y -axis and passes through points $C(k, 4), D(-5, 7)$,

then $k =$ (6 , 3 , 5 , -5)

f The slope of the straight line which makes an angle of measure 45° with the positive direction of X -axis is

(1 , 2 , 0.5 , 3)

g If $\sin 2x = 0.5$, where x is the measure of an acute angle, then $x =$

(15 , 20 , 60 , 30)

h If ABC is a right-angled triangle at B and $\sin A = \frac{1}{2}$, then $\cos C =$

(1 , $\frac{1}{2}$, $\frac{\sqrt{3}}{2}$, $\frac{\sqrt{3}}{4}$)

i The equation of the straight line passing through the origin point and its slope $= 3$ is

($y = 3x$, $x = 3y$, $y = 5x$, $y = x$)

2 Answer each of the following:

21

- a Find the value of x if: $\tan x = \frac{\sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ}{\sin 45^\circ \cos 60^\circ + \sin 45^\circ \sin 60^\circ}$

$$\tan x = \frac{\frac{1}{2} \times \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}}{\frac{1}{\sqrt{2}} \times \frac{1}{2} + \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}} = 1 \quad \therefore \tan x = 1 \quad \therefore x = 45^\circ$$

- b In the opposite figure: $\overline{AD} \perp \overline{BC}$, $AC = 17$ cm, $DC = 15$ cm, $AB = 10$ cm, find the value of:

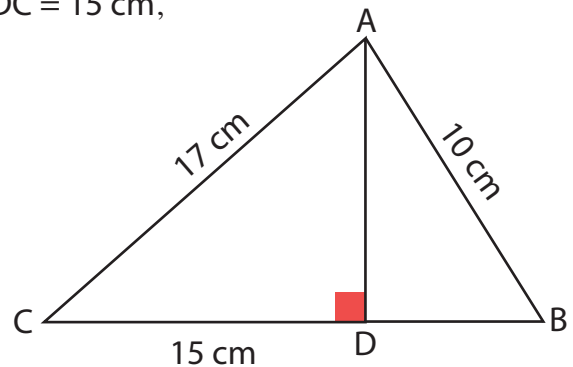
$$17 \sin (\angle C) + 5 \cos (\angle B)$$

$$\text{In } \triangle ADC, AD = \sqrt{(17)^2 - (15)^2} = 8 \text{ cm}$$

$$\text{In } \triangle ABD, BD = \sqrt{(10)^2 - (8)^2} = 6 \text{ cm}$$

$$\text{Then, } 17 \sin (\angle C) + 5 \cos (\angle B)$$

$$= 17 \times \frac{8}{17} + 5 \times \frac{6}{10} = 8 + 3 = 11$$



- c Find the equation of the straight line whose slope is 7 and intercepts from the positive part of y-axis 4 length units.

$$\therefore y = mx + c$$

$$\text{and } m (\text{slope}) = 7, \quad \text{the intercept part of y-axis} = 4$$

$$\therefore \text{the equation is: } y = 7x + 4$$

- d Prove that the points $A(4, 3)$, $B(1, 1)$ and $C(-5, -3)$ are collinear.

$$\text{Slope of } \overrightarrow{AB} = \frac{1-3}{1-4} = \frac{-2}{-3} = \frac{2}{3}$$

$$\text{Slope of } \overrightarrow{BC} = \frac{-3-1}{-5-1} = \frac{-4}{-6} = \frac{2}{3}$$

$$\text{Then, Slope of } \overrightarrow{AB} = \text{Slope of } \overrightarrow{BC}$$

The points A, B and C are collinear.

- e Find the equation of the straight line which passes through the point $(9, 2)$ and is parallel to the straight line: $2y = -8x + 4$

The slope of the straight line: -4

$$\text{In the equation: } y = mx + C \quad \therefore y = -4x + C$$

The straight line passes through the point $(9, 2)$

$$\text{The intercept part of y-axis: } 2 = -4 \times 9 + C \quad \therefore C = 38$$

$$\text{The equation is: } y = -4x + 38$$

- f Without using calculator, prove that: $\sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$

$$\text{The L.H.S} = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\text{The R.H.S} = 2 \sin 30^\circ \cos 30^\circ$$

$$= 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

$$\therefore \text{L.H.S} = \text{R.H.S}$$

$$\therefore \sin 60^\circ = 2 \sin 30^\circ \cos 30^\circ$$

- g The straight line whose equation is $5y = 10x - 15$, find:

1 Its slope.

2 The intercept part of y-axis.

$$\text{The equation: } 5y = 10x - 15$$

$$\text{then, } y = 2x - 3$$

1 The slope is 2

2 The intercept part of y-axis is -3

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

امتحانات رقم (2)

الترم الاول



ALGEBRA – MODEL NO 1**[Q1] A) Choose the correct answer:**

(1) 30 % of 600 =

- a) 1.8 b) 18 c) 180 d) 1800

(2) If $(X + 1, 2) = (5, Y - 3)$, then $\sqrt{X + Y} = \dots\dots\dots$

- a) 2 b) 3 c) 6 d) 9

(3) If X, Y are two sets where $n(X \times Y) = 11$, then $n(X) + n(Y) = \dots$

- a) 8 b) 9 c) 11 d) 12

[B] If a, b, c, d are in continued proportion prove that :

$$\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

[Q2] Choose the correct answer:(1) The range of the values: $X + 4, X - 3, X + 8$, where X is a real number is

- a) 1 b) 4 c) 7 d) 11

(2) If $a, 5, b, 7$ are proportion quantities, then $\frac{a}{b} = \dots\dots\dots$

- a)
- $\frac{5}{7}$
- b)
- $\frac{7}{5}$
- c) 5 d) 7

(3) If the real-length is 6 m, length-in drawing is 6 cm, then the drawing scale is

- a) 1 : 1 b) 1 : 10 c) 1 : 100 d) 1 : 1000

[B] If $X \times Y = \{(3, 2), (1, 2), (2, 4), (3, 4), (1, 4), (2, 2)\}$ **Find:**

① X, Y

② $(X - Y) \times (X \cap Y)$

[Q3] [A] If $X = \{1, 3, 4, 5\}$, $Y = \{1, 2, 3, 4, 5, 6\}$ and \mathcal{R} is relation from X to Y where $a \mathcal{R} b$ means " $a + b = 7$ " for $a \in X, b \in Y$.

- ① Write \mathcal{R} and represents it with arrow diagram.
- ② Show that if \mathcal{R} is function or not? and why? if it is function find its range.

[B] If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{2}{3}$, and $5a - 3c + e = 18$.

Find the value of: $5b - 3d + f$

[Q4] [A] If $\mathcal{F}: \mathcal{F}(x) = Kx^2 + (3K + 2)x + 6$, and X - coordinate of the vertex of the curve is -2 , find:

- ① The value of K
- ② Minimum or Maximum value of function \mathcal{F}

[B] If the number of hours (n) needed for carrying out a work varies inversely as the number of workers (X) who carry out this work. If the work is carried out by 6 workers within 4 hours, what is the needed time for carrying out the work by 8 workers?

[Q5] [A] Calculate the standard deviation of the values:

12, 13, 16, 18, 21

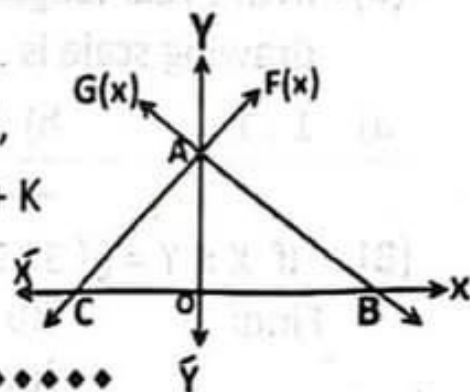
[B] In the opposite figure:

\overline{AC} Represents the linear function $\mathcal{F}(x) = X + 3$,

\overline{AB} Represents the linear function $\mathcal{G}(x) = mX + K$

If Length of $\overline{BC} = 7$ length units, find:

- ① Value of K, m
- ② $\mathcal{G}(8)$



ALGEBRA — MODEL NO (2)

[Q1] A) Choose the correct answer:

(1) If $\{3, 6\} = \{x + 1, 3\}$ then $x = \dots\dots\dots$

- a) 2 b) 3 c) 4 d) 5

(2) If $y \propto x$ and $y = 2$ when $x = 6$, then $y = \dots\dots\dots$ when $x = 2$

- a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{2}$ d) 3

(3) If the range of set of the values is 9 and the highest value is 15, then the lowest value is $\dots\dots\dots$

- a) 24 b) 18 c) 6 d) 3

[B] If $X - Y = \{3\}$, $Y - X = \{1, 5\}$, $X \cap Y = \{6\}$

Find :1) X, Y 2) $(X \cap Y) \times X$

[Q2] Choose the correct answer:

(1) 27 months : 3 years = $\dots\dots\dots$: $\dots\dots\dots$ in the simplest form

- a) 9 : 1 b) 1 : 9 c) 3 : 4 d) 9 : 10

(2) The S.S. of the $\sqrt{x^2} = 4$ in R

- a) $\{2, -2\}$ b) $\{4, 4\}$ c) $\{16, -16\}$ d) $\{4\}$

(3) If $X = [-4, 2]$, $Y = [-2, 5]$, then $(3, -3) \in \dots\dots\dots$

- a) $X \times Y$ b) $Y \times X$ c) X^2 d) Y^2

[B] If a, b, c, d are in continued proportional . Prove that:

$$\frac{c^2 - d^2}{a - c} = \frac{bd}{a}$$

[03] [A] If $f(x) = x^2 - 3x$, $g(x) = x - 3$ Find:

① $f(\sqrt{2}) + 3g(\sqrt{2})$

② All values of x which make $f(x) = g(x)$

[B] If $X = \{-1, 0, \frac{1}{2}, 2\}$ and R is a relation on X where $a R b$ means " a is the multiplicative inverse of b " for each of $a \in X$, $b \in X$. write R and show with reason if R is a function or not ?

[04] [A] If $y = a - 9$ and $y \propto \frac{1}{x^2}$ and $a = 18$ when $x = \frac{3}{2}$ Find:

① the relation between y and x

② the value of y when $x = 1$

[B] Through the interest of the Egyptian authorities with the villages, If the ratio between lengths of two roads is $2 : 5$, and the difference between them is 21 Km.

① Calculate the length of them in kilometer.

② If the cost of paving 1 Km. is 2 million Egyptian pounds, find the total cost of paving the two roads?

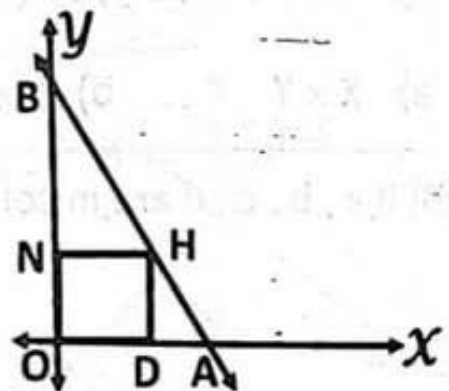
[05] [A] Calculate the standard deviation of the set of values:
5, 6, 7, 8 and 9

[B] In the opposite figure:

The linear function f where: $f(x) = kx + m$ represent graphically by straight line \overline{AB} where $A(3,0)$, $B(0,6)$, $ONHD$ is square

① Write the rule of function f ?

② Find the area of square $ONHD$?



.....
End of the questions

ALGEBRA – MODEL No (3)**[Q1] A) Choose the correct answer:**

(1) The difference between smallest and greatest some of values is called

- a) Range b) Mode c) Mean d) Standard deviation

(2) If X, Y are two sets where $X \subset Y, Y = \{0,1,2\}$, then $n(X \times Y) \in \dots$

- a) $\{0, 3\}$ b) $\{0, 3, 6\}$ c) $\{3, 6, 9\}$ d) $\{0, 3, 6, 9\}$

(3) If F is polynomial function of second degree, $F(K-5) = F(3-K)$, then the equation of axis of symmetry of curve of function is ...

- a) $X = 1$ b) $X = -1$ c) $Y = 1$ d) $Y = -1$

[B]. If a, b, c are in continued proportion, prove that:

$$\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{12}{c}$$

[Q2] Choose the correct answer:

(1) If $\frac{a}{5} = \frac{b}{7}$, then $\frac{a+b}{60} = \frac{a}{\dots}$

- a) 5 b) 10 c) 15 d) 25

(2) If $XY = 3$, then $Y \propto \dots$

- a) X b) $3X$ c) $\frac{1}{x}$ d) $\frac{1}{3} X$

(3) If a, b, c are proportion quantities, $\frac{a}{c} = \dots$

- a) $\frac{c^2}{b^2}$ b) $\frac{b^2}{c^2}$ c) $\frac{b^2}{a^2}$ d) $(bc)^2$

[B] Calculate the mean and the standard deviation for the following data: 8, 9, 7, 6, 5

[03]

[A] if $X = \{2, 3, 4\}$, $Y = \{Y : Y \in \mathbb{N}, 2 \leq Y \leq 9\}$ where \mathbb{N} is set of natural number and R is relation from X to Y where $a \mathcal{R} b$ means $((a = \frac{1}{2}b))$ for each $a \in X, b \in Y$, find R and represents it by arrow diagram, then show that \mathcal{R} is function from X to Y and find its range.

[B] If $\frac{x+y}{11} = \frac{y+z}{9} = \frac{z+x}{4}$ prove that: $\frac{x+y+z}{5x+4y+3z} = \frac{6}{25}$

[04]

[A] IF $\mathcal{F}(x) = (a-2)x^2 + (b+3)x + c - 2$ is polynomial function of zero degree and its range $\{5\}$. Find $a + b + c$

[B] If a, b, c, d are positive quantities and $\frac{a^2-2c^2}{b^2-2d^2} = \frac{a^2}{b^2}$
Prove that: a, b, c, d are proportional quantities

[05]

[A] If $Y = 3 + a$ and $a \propto \frac{1}{x}$ and $Y = 5$ when $X = 1$

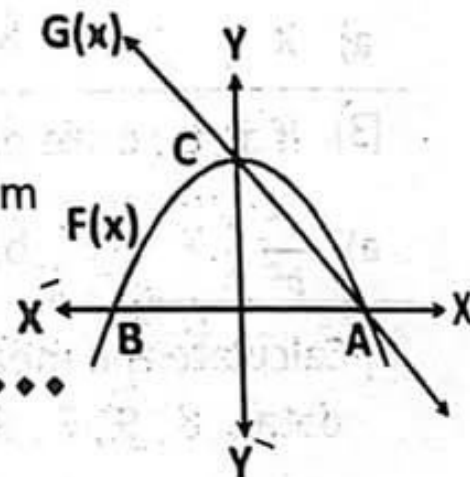
- ① Find the relation between X, Y
- ② Find the value of Y when $X = 2$

[B] In the opposite figure:

The curve represents $F(x) = 4 - x^2$,

\overline{AC} Represents the linear function $G(x) = KX + m$

- ① Find the value of K, m
- ② $F(1) + G(1)$



.....
End of the questions

ALGEBRA – MODEL NO (4)

[01] A) Choose the correct answer:

(1) If $a < 0$, $b > 0$, then the point $(2^a, 3^b)$ lies in the quadrant

- a) First b) Second c) Third d) Fourth

(2) If 4, 6, K are proportional quantities, then $K = \dots\dots\dots$

- a) 10 b) 9 c) 2 d) 24

(3) If $F(x) = X - 5$ and $\frac{1}{2} F(a) = 3$, then $a = \dots\dots\dots$

- a) 2 b) 8 c) 11 d) 16

[B] If $X^4 Y^2 - 14 X^2 Y + 49 = 0$

Prove that: $Y \propto \frac{1}{x^2}$

[02] Choose the correct answer:

(1) If $F(x) = aX + b$, and $F(a) = b$, then $\sqrt{9 - ab} = \dots\dots$

- a) Zero b) 3 c) -3 d) ± 3

(2) If $n(x) = K + 3$, $n(Y) = K - 3$, $n(X \times Y) = 16$, then $K = \dots\dots$

- a) 5 b) -5 c) ± 5 d) 25

(3) If $Y \propto X$, and $Y = 5$ when $X = 3$, then the variation constant =

- a) 15 b) 5 c) 3 d) $\frac{5}{3}$

[B] If $\frac{a}{b} = \frac{c}{d} = \frac{e}{x} = \frac{3}{2}$, $2a + c - 3e = 18$, $2b + d = 15$

Find the value of X?

[A] If $X = \{-3, -2, -1, 0, 1, 2, 3\}$, $Y = [0, 9[$ and R is relation from X to Y where $a \mathcal{R} b$ means $((a^2 = b))$ for each $a \in X, b \in Y$, find R and represents it by arrow diagram, then show that \mathcal{R} is function from X to Y or not? With reason.

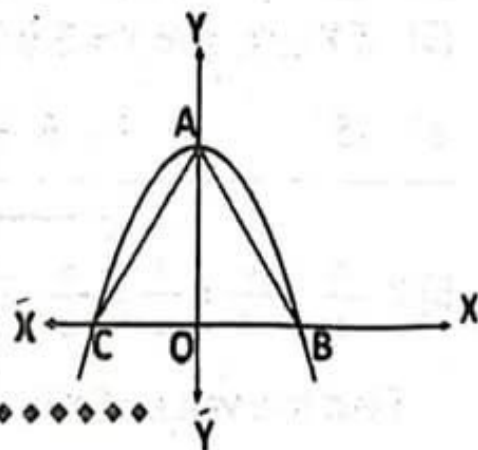
[B] If $\frac{a}{b+c} = \frac{1}{3}$, $\frac{c}{a+b} = \frac{5}{7}$ Find the value of: $\frac{b}{a+c}$

[A] If $F(x) = a + X^2$, $L(x) = C$ are two polynomial function where a, c are constant and $3 F(2) + 3 L(x) = 6$
Find the numerical value of $2 F(0) + 2 L(7)$

[B] Calculate the standard deviation for the following values:
65, 61, 70, 64, 70, 76, 70

[A] A car is moved with constant speed where the travelled distance is directly variation with the time, if the car travelled 150 Km in 6 hours, how many kilometers the car travelled in 10 hours

② Find area of $\triangle ABC$



End of the questions

ALGEBRA – MODEL NO (5)**[Q1] A) Choose the correct answer:**

(1) The simplest measure of dispersions is

- a) Range b) Mode c) Mean d) Standard deviation

(2) Which of the following represents inversely variation between X, Y is

- a) $Y = X$ b) $Y = X^2$ c) $XY^2 = 1$ d) $Y = \frac{3}{x}$

(3) If $X^2 = \{ (3K - 4, K) \}$, $Y = \{ 1, 7 \}$ which of the following ordered pair belongs to Cartesian product $X \times Y$?

- a) $(4, 1)$ b) $(3, 1)$ c) $(2, 1)$ d) $(3, 7)$

[B] Calculate the mean and standard deviation for the following values: 5, 16, 20, 27, 32

[Q2] Choose the correct answer:

(1) If $F(x) = 3X + 5$, and $m + n = 9$, then $F(m) + F(n) = \dots$

- a) 14 b) 27 c) 32 d) 37

(2) If 2 is mean proportion between a, b , then the positive mean proportion between $(a + \frac{1}{b})(b + \frac{1}{a})$ is

- a) 6 b) 4 c) 6.25 d) 2.5

(3) If $F: F(x) = (n - 3)X^2 + 5$ has maximum value, then $n \in \dots$

- a) $]3, \infty[$ b) $] -\infty, 3[$ c) $\{3, 5\}$ d) $]5, \infty[$

[B] IF $\frac{x+y}{19} = \frac{y+z}{7}$ Prove that: $\frac{x-z}{x+2y+z} = \frac{6}{13}$

[03]

- [A] If $X = \{1, 4, 7\}$, $Y = \{-1, 1, 4, 7\}$ and \mathcal{R} is relation from X to Y where $a \mathcal{R} b$ means $((a + |b| = 8))$ for each $a \in X, b \in Y$, find \mathcal{R} and represents it by arrow diagram, then show that \mathcal{R} is function from X to Y or not? With reason.

- [B] If $\frac{a}{b} = \frac{2}{3}, \frac{a}{c} = \frac{3}{5}, a + b + c = 75$, find the value of a, b, c

[04]

- [A] If $F(x) = 5x - K, G(x) = x - 2K$ where K is constant
And $F(1) + G(3) = -7$, find $F(3) + G(1)$

- [B] If $Y = 3 + Z, Z \propto \frac{1}{x}$, find the relation between X, Y where $Y = 5$ at $X = 1$. Then find Y when $X = 2$

[05]

- [A] If $\frac{21x-y}{7x-z} = \frac{y}{z}$, prove that Y directly variation with $Z, X \neq 0$

- [B] In the opposite figure:

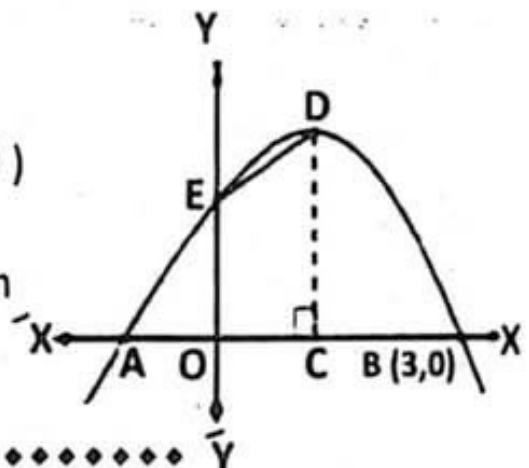
The curve represents the curve
of $F(x) = -x^2 + 2x + K - 1$

Where D is vertex of the curve, $B(3, 0)$

Find: ① Value of K

② Maximum value of the function

③ Area of the figure DCOE



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End of the questions

ALGEBRA – MODEL NO (6)

[Q1] A) Choose the correct answer:

(1) If the point (X, Y) lies in the third quadrant, then the point (X^3, Y^2) lies in the quadrant

- a) First b) Second c) Third d) Fourth

(2) If $5X = 9Y$, then $\frac{3X}{2Y} = \dots\dots\dots$

- a) $\frac{27}{10}$ b) $\frac{9}{5}$ c) $\frac{5}{9}$ d) $\frac{81}{25}$

(3) If X, Y are two sets, $n(X \times Y) = 5$, then $n(X) - n(Y) = \dots\dots\dots$

- a) 4 b) Zero c) -4 d) ± 4

[B] Calculate the mean and standard deviation for the following values: 8, 9, 7, 6, 5

[Q2] Choose the correct answer:

(1) If $(a, 4)$ one of the points of function $F: R \rightarrow R, F(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$

- a) 12 b) 9 c) 6 d) 3

(2) If 2, 6, $x + 15$ are proportional, then $X = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) $-\frac{3}{2}$

(3) If $XY^5 = \text{constant}$, then X inversely variation with....

- a) $\frac{1}{5}$ b) Y^5 c) Y d) Y^2

[B] IF $a + b : b + c : c + a = 6 : 7 : 8$, $a + b + c = 14$

Find the value of c ?

[03]

[A] If $X = \{-2, 2, 5\}$, $Y = \{3, 7, K\}$ and \mathcal{R} is function from X to Y where $a \mathcal{R} b$ means $((b = a^2 - 1))$ for each $a \in X$, $b \in Y$, find the value of K and represent the function by arrow diagram.

[B] If a, b, c, d are in continued proportion, prove that:

$$\frac{a}{b^2 c^2} + \frac{b}{c^2 a^2} + \frac{c}{a^2 b^2} = \frac{1}{a^3} + \frac{1}{b^3} + \frac{1}{c^3}$$

[04]

[A] If $F: F(x) = (m - 3)x^2 + (2 - K)x + 2K + 3m$ is polynomial function of first degree, if $F(1) = 12$, find the value of K, m

[B] IF $X = Z + 8$, and Z inversely variation with Y , and $Z = 2$ when $Y = 3$, find the relation between X, Y and find the value of Y at $X = 3$

[05]

[A] If $2a = 3b = 4c$, find the numerical value of the expression:

$$\frac{a^2 + b^2 + c^2}{a(b + c)}$$

[B] In the opposite figure:

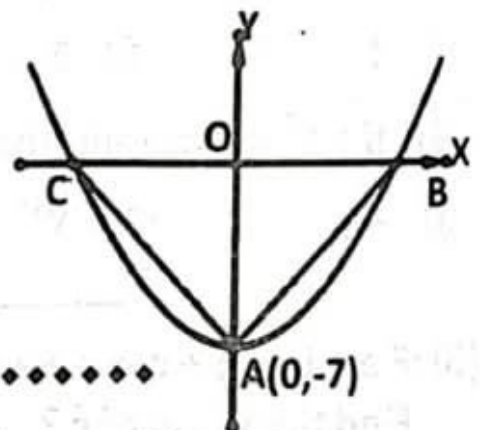
The curve of $F(x) = Lx^2 - 7$,

Area of $\triangle ABC = 21$ square units

$A(0, -7)$.

① Find the coordinate of point B, C

② Find the value of L



.....
End of the questions

ALGEBRA – MODEL No (7)**[Q1] A) Choose the correct answer:**

(1) If all values are equal, then

- a) $X - \bar{X} > 0$ b) $X - \bar{X} < 0$ c) $\sigma = 0$ d) $\bar{X} = 0$

(2) IF the point $(X - 4, 2 - X)$ lies in the third quadrant, then $X \in \dots$

- a) $[2, 4]$ b) $]2, 4[$ c) $[-4, -2]$ d) $] -4, -2[$

(3) If $\frac{y+3}{y} = \frac{x+2}{x}$, where $X \neq Y \neq 0$, then

- a) $Y \propto X$ b) $Y \propto \frac{1}{x}$ c) $Y \propto X + 2$ d) $Y \propto X + 5$

[B] Calculate the mean and standard deviation for the following values:
73, 54, 62, 71, 60

[Q2] Choose the correct answer:(1) If the straight line $X = 2$ is axis of symmetry of the curve of function $F: F(x) = X^2 + KX + 4$, then $K = \dots$

- a) -4 b) -2 c) 2 d) 4

(2) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then $\frac{a}{d} = \dots$

- a) 2 b) 4 c) 8 d) 16

(3) If $X \subset Y$, then $n[(X - Y) \times Y] = \dots$

- a) Zero b) 1 c) 2 d) 3

[B] IF $bc + ab + ac = abc$, find the value of:

$$\frac{b+c}{bc(a-1)} + \frac{a+c}{ac(b-1)} + \frac{a+b}{ab(c-1)}$$

[03]

- [A] IF $X = \{-2, -1, 0, 1, 2\}$ and R is relation on X where $a R b$ means $((a + b = \text{zero}))$ for each $a \in X, b \in Y$. write R and represents it with arrow diagram and show that R is function or not?
-

- [B] If positive quantities $5a, 6b, 7c, 8d$ are in continued proportion, prove that:

$$\sqrt[3]{\frac{5a}{8d}} = \sqrt{\frac{5a+6b}{7c+8d}}$$

[04]

- [A] IF $F(x) = 2X + K, G(x) = X^2 + K$ and $F(2) + G(-4) = 30$
Find $F(-2) + G(2)$
-

- [B] IF $Y = a - 1, a \propto \frac{1}{x^2}$, find the relation between x, y where $a = 4$ at $x = 2$, then find value of X at $y = 8$
-

[05]

- [A] If $\frac{21x-y}{7x-z} = \frac{y}{z}$, prove that $Y \propto Z, X \neq 0$
-

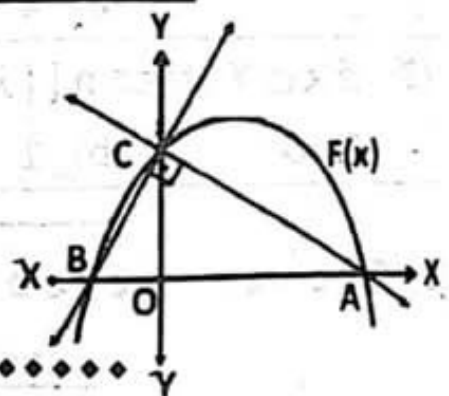
[B] In the opposite figure:

Curve of the function

$$F: F(x) = -X^2 + KX + m$$

IF $\overline{AC} \perp \overline{BC}, OC = 3 \text{ units}, OA = 9 \text{ OB}$

Find the value of K, m



.....
End of the questions

ALGEBRA – MODEL No (8)**[Q1] A) Choose the correct answer:**(1) If point A ($X - 5$, $X - 3$) lies on X - axis, then point A is

- a) (0, 2) b) (2, 0) c) (-2, 0) d) (0, -2)

(2) All the following functions are polynomial except $F(x) = \dots\dots\dots$

- a)
- $X + 3$
- b)
- $\sqrt{2x} + 3$
- c)
- $X(X + \frac{1}{X})$
- d)
- $X^2(X + 4)$

(3) If the range of values 7, 3, 6, K, 5 is 6, then $K = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 12

[B]. If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{6, 5\}$, find:

① $X \times (Y \cap Z)$

② $(X - Y) \times (Y - Z)$

[Q2] Choose the correct answer:(1) If $X = [-2, 2[$, $Y = [0, 4]$, then $(-2, -1) \in \dots\dots\dots$

- a)
- X^2
- b)
- Y^2
- c)
- $X \times Y$
- d)
- $Y \times X$

(2) If $\frac{3}{4}a = \frac{3}{2}b = 3c$, then $a : b : c = \dots\dots\dots$

- a) 3 : 4 : 2 b) 1 : 2 : 4 c) 4 : 2 : 1 d) 4 : 3 : 2

(3) Which of the following relations represents inversely variation between X, Y

- a)
- $Y = X$
- b)
- $Y = X^2$
- c)
- $XY^2 = 1$
- d)
- $Y = \frac{3}{x}$

[B] If b is middle proportion between a, c

Prove that:

$$\frac{a+b+c}{a^{-1}+b^{-1}+c^{-1}} = b^2$$

[03]

[A] If $X = \{1, 2, 4\}$, $Y = \{4, 5, 2, 7\}$ and \mathcal{R} is function from X to Y where $a \mathcal{R} b$ means $((a + b = 6))$ for each $a \in X$, $b \in Y$.

① Write \mathcal{R} and represents it with arrow diagram

② Prove that \mathcal{R} is a function and write its domain

[B] Calculate the standard deviation for the following values:

5, 6, 7, 8, 9

[04]

[A] If the value of speed V that water passes through a hose nozzle inversely change with square of the hose nozzle radius length r and $V = 5 \text{ m/s}$ when $r = 3$, find V when $r = 2.5 \text{ cm}$



[B] If $F(x) = ax + b$, $F(x) = b$

Find the value of $\sqrt{ab^2 + 25}$

[05]

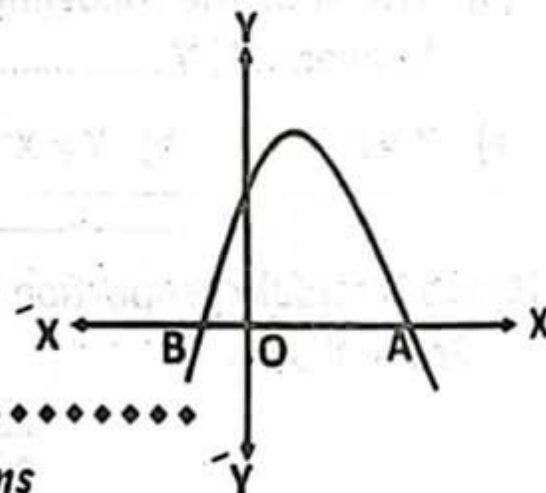
[A] If $X - Y = \frac{x+y}{7} = \frac{xy}{4}$. Find the value of: XY

[B] In the opposite figure:

The curve of $F: F(x) = -x^2 + 4x + K - 1$

If $OA = 5OB$

Find the value of K ?



.....
End of the questions

ALGEBRA – MODEL NO 9**[Q1] A) Choose the correct answer:**

(1) If $F(x) = 3$, then $6 F\left(\frac{1}{2}\right) = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 18

(2) If $(X^2 + Y^2, 3) = (10, XY)$ then $X - Y = \dots\dots\dots$

- a)
- ± 2
- b)
- ± 3
- c)
- ± 4
- d)
- ± 6

(3) If the point $(X - 2, Y + 4)$ lies on the two axes X and Y , then $X + Y = \dots\dots\dots$

- a) 2 b) -2 c) 6 d) -6

[B] IF $4a^2 + b^2 = 4ab$

① Prove that $b \propto a$ ② find value of a when $b = 8$ **[Q2] Choose the correct answer:**

(1) If $F\left(\frac{2x+1}{3x-1}\right) = 2x$, then $F(1) = \dots\dots\dots$

- a)
- $\frac{1}{2}$
- b) 1 c) 2 d) 4

(2) If $\frac{a}{b} = \frac{3}{5}$, $5a - 2b = 20$, then $b = \dots\dots\dots$

- a) 3 b) 5 c) 15 d) 20

(3) Which of the following relations represents inversely variation between $X, Y \dots\dots\dots$

- a)
- $Y = 4X$
- b)
- $Y = X + 5$
- c)
- $\frac{x}{y} = \frac{5}{7}$
- d)
- $\frac{x}{5} = \frac{2}{y}$

[B] IF $\frac{x+2y}{a+4b} = \frac{2y+5z}{4b+7c} = \frac{5z+x}{7c+a}$, prove that: $a y = 2 b x$

[A] If $X = \{-3, -2, -1, 0, 1, 2, 3\}$, $Y = [0, 9[$ and \mathcal{R} is relations from X to Y where $a \mathcal{R} b$ means $((a^2 = b))$ for each $a \in X, b \in Y$.

- ① Write R and represents it with arrow diagram
- ② Prove that R is a function. (Give reason)

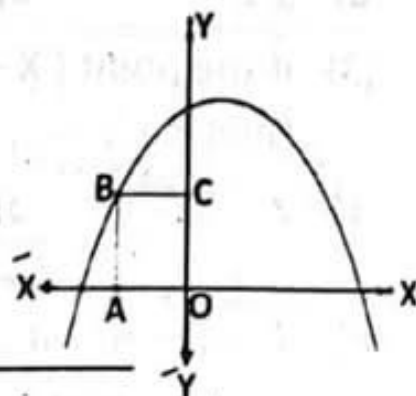
[B] If $\frac{21x+a}{7x+b} = \frac{a}{b}$, $x \neq 0$, find the value of $\frac{a+2b}{2a}$

[A] In the opposite figure:

$$F : F(x) = -x^2 - x + 5,$$

The figure OABC is square

Find the area of square OABC?



- [B] IF $Y = a + b$, where a is constant, $b \propto X$ and $Y = 3$ when $X = 0$ and $Y = 5$ when $X = 3$.

Find the relation between X , Y then find Y at $X = 7$

[A] IF $F(x) = K X^2 + (3 K + 2) X + 6$ and the X coordinate of the vertex of the curve $F(x)$ equal -2

Find the value of $F(1) + F(-1)$

- [B] The following table shows the number of excellent students in mathematics in 10 preparatory schools in Dakahlia

No. of students	4	6	8	5	Sum
Number of schools	1	2	3	4	10

Calculate the arithmetic mean and standard deviation

◆ ◆

End of the questions

ALGEBRA – MODEL NO (10)

[Q1] A) Choose the correct answer:

(1) If $X = \{3\}$, then $n(X^2) = \dots\dots\dots$

- a) 1 b) 9 c) $\{(3, 3)\}$ d) $\{(3, 9)\}$

(2) If $X + Z - Y = 0$, $10X + 2Z - 5Y = 0$, then $Y : Z = \dots\dots$

- a) 5 : 8 b) 8 : 5 c) 3 : 8 d) 8 : 3

(3) If $(K^2, K) \in F$, $F(x) = 2X - 3$, then K may be equal $\dots\dots\dots$

- a) 1 b) $\frac{2}{3}$ c) $-\frac{3}{2}$ d) -1

[B] Calculate the mean and standard deviation for the following values: 8, 9, 7, 6, 5

[Q2] Choose the correct answer:

(1) If $(a, 4)$ on of the points of function $F : \mathbb{R} \rightarrow \mathbb{R}$, $F(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$

- a) 12 b) 9 c) 6 d) 3

(2) Which of the following is dispersion measure?

- a) Median b) Mean c) Mode d) range

(3) Which of the following relations represents directly variation between $X, Y \dots\dots\dots$

- a) $XY = 5$ b) $Y = X + 3$ c) $\frac{x}{3} = \frac{4}{y}$ d) $\frac{x}{5} = \frac{y}{2}$

[B] If $\frac{a}{3x+4y} = \frac{b}{5x-2y} = \frac{c}{y+2x}$, prove that:

$$13X(3c - 2a) + 5Y(a + 2b) = \text{Zero}$$

[03] [A] If $X = \{1, 2, 3, 6, 11\}$, and R is relations on X where $a R b$ means $((a + 2b = \text{odd number}))$ for each $a \in X, b \in X$.

- ① Write R and represents it with arrow diagram
- ② Prove that R is a function. (Give reason)

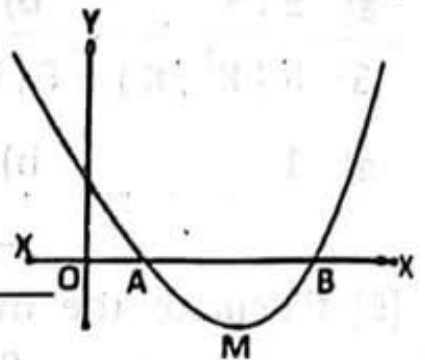
[B] IF a, b, c, d are in continued proportion, prove that:

$$\frac{a^2 + b^2 + c^2}{b^2 + c^2 + d^2} = \frac{a}{b} \cdot \frac{c}{d}$$

[04] [A] In the opposite figure:

The curve of quadratic function

Cut X-axis in $A(1, 0), B(4, 0)$, M is vertex of curve and $F(-2) + F(7) = 8$, Find $F(-2)$



[B] From the following table:

X	2	4	6	a	3
Y	6	3	2	$2\frac{2}{5}$	b

- ① Determine the type of variation between X, Y
- ② Find the value of a, b

[05] [A] Two positive real numbers, ratio between them is $4 : 7$, square of the smallest is more than five times the greatest by 29. Find the two numbers

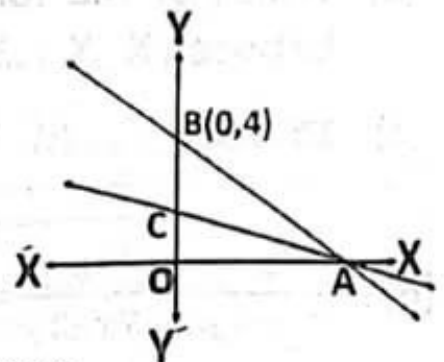
[B] In the opposite figure:

\overrightarrow{AC} represents the linear function

$F(x) = 2 - \frac{2}{3}x$, \overrightarrow{AB} represents

The linear function $G(x) = Kx + m$

IF point $B(0, 4)$. Find the value of K, M



.....
End of the questions

GEOMETRY – MODEL NO (1)**[Q1] A) Choose the correct answer:**

(1) The sum of the measures of the accumulative angles at a point
=^o

- a) 90 b) 180 c) 270 d) 360

(2) If the figure ABCD is a rhombus, where A (7 , 1) , B (1 , 9) ,
then the perimeter of rhombus = units

- a) 10 b) 14 c) 40 d) 100

(3) The quadrilateral in which its diagonals bisect each other and
perpendicular is called

- a) Trapezium b) Parallelogram c) Rectangle d) Rhombus

[B] By using the slope:

Prove that the points A (- 1 , - 3) , B (4 , 7) , C (1 , 1) are collinear.

[Q2] Choose the correct answer:

(1) If the figure ABCD is a parallelogram, then: $\sin \left(\frac{A+B}{4} \right) = \dots\dots$

- a) $\frac{1}{2}$ b) $\frac{\sqrt{2}}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\sqrt{2}$

(2) If \overline{LN} is diameter in a circle its center M, where L (- 2 , 3) ,
N (6 , - 5) , then coordinates of point M are

- a) (2 , 1) b) (- 2 , - 1) c) (2 , - 1) d) (- 2 , 1)

(3) If 5 cm, 9 cm, X cm are sides lengths of a triangle, then X may
be equal

- a) 4 b) 10 c) 14 d) 18

[B] If the distance between two points (X , 5) and (6 , 1)
equals $2\sqrt{5}$ length units, find the values of X.

[Q3] [A] $\triangle XYZ$ is right at Y , $XY = 9$ cm, $XZ = 15$ cm

Find the value of: $\cos^2 Z - \cos^2 X$

[B] Find the measure of the positive angle which the straight line L makes with the positive direction of X -axis if the straight line L is parallel to the straight line: $X - Y = 3$

[Q4]

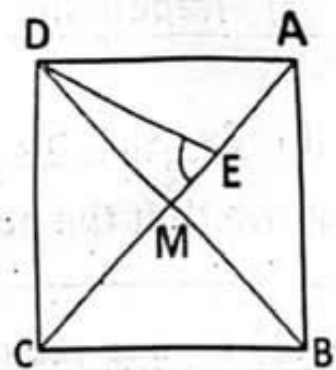
[A] If \overline{AD} is a median in $\triangle ABC$, m is midpoint of \overline{AD} , if $m(-3, -2)$, $B(-2, 4)$, $C(0, 6)$. Find the coordinates of point A

[B] In the opposite figure:

$ABCD$ is square its diagonals intersect at M

$E \in \overline{AC}$, $CE = 5$ cm, $AE = 3$ cm

Find: $\tan(\angle DEC)$



[Q5]

[A] If $2 \cos X = \tan 60^\circ \tan 45^\circ$ where X is acute angle,

Find: $\tan 2X$

[B] In the opposite figure:

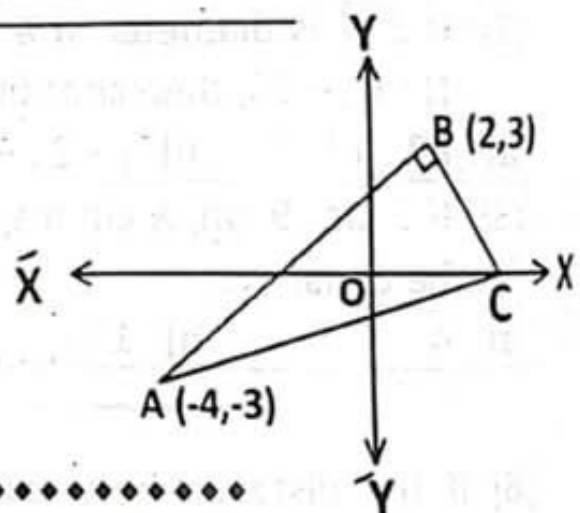
$A(-4, -3)$, $B(2, 3)$

And $\overline{AB} \perp \overline{BC}$

Find:

① The Coordinates of point C

② The equation of \overline{AC}



.....

End of the questions

GEOMETRY – MODEL No (2)

[Q1] A) Choose the correct answer:

- (1) The acute angle complements angle
a) Zero b) Acute c) Right d) Obtuse
- (2) The slope of straight line whose equation $Y = 3$ is
a) Zero b) 1 c) 3 d) Undefined
- (3) AB is a diameter in the circle M, where $M (2, -1)$, $A (-2, 3)$, then the coordinate of point B is
a) $(0, 1)$ b) $(0, 2)$ c) $(2, -2)$ d) $(6, -5)$

[B] if $A (3, 1)$, $B (1, 2)$, $C (5, 4)$. Prove that: $BC = 2 AB$

[Q2] Choose the correct answer:

- (1) The two perpendicular straight lines to third are
a) Parallel c) Intersecting
b) Perpendicular d) Intersecting on perpendicular
- (2) If the area of a square is 18 cm^2 , then the length of its diagonal equals cm
a) 3 b) $3\sqrt{2}$ c) 6 d) 9
- (3) In $\triangle ABC$ right at B, if $2 AB = \sqrt{3} AC$, then $m(\angle C) = \dots\dots^\circ$
a) 30 b) 45 c) 60 d) 75

[B] If the points $A (0, 1)$, $B (X, 3)$, $C (2, 5)$ are collinear, find the value of X?

[Q3] [A] If $\cos X = \sin 30^\circ \tan 45^\circ$ (Where X is an acute angle)

Find the value of: $\tan^2 X - \sin^2 (X - 15)$

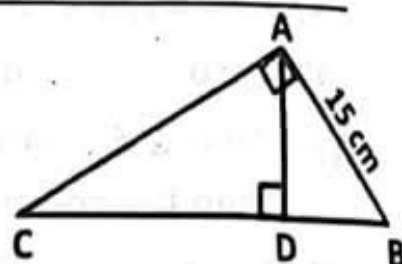
[B] In $\triangle ABC$, $A(2, 1)$, $B(2, 5)$, $C(3, 4)$ and D, E are midpoint of \overline{AB} , \overline{AC} . Find equation of \overline{DE} .

[Q4]

[A] In the opposite figure:

$\triangle ABC$ right at A, $\overline{AD} \perp \overline{BC}$, $AB = 15$ cm

$\tan(\angle BAD) = \frac{3}{4}$, Find the area of $\triangle ABC$



[B] If the straight line L_1 passes through $(3, 1)$, $(2, 2)$ and the straight line L_2 make with positive direction of X-axis a positive acute angle of measure E° , where $\sin E = \frac{1}{\sqrt{2}}$

Prove that: L_1, L_2 are perpendicular

[Q5] [A] The $\triangle ABC$ is an isosceles triangle where $AB = AC = 12.6$ cm, $m(\angle C) = 54^\circ 24'$, find to the nearest one decimal place the length of \overline{BC} .

[B] In the opposite figure:

$L_1 \parallel L_2$, where equation of $L_1: Y = 5 - X$,

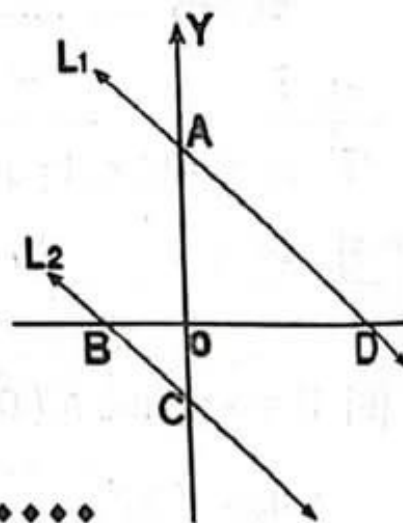
And L_1 cut the two axes at the points D, A

And L_2 cut the two axes at the points B, C

Where $AC = 7$ length units. Find:

1) Coordinate of points B, C

2) Equation of the straight line L_2



.....

End of the questions

GEOMETRY – MODEL NO (3)

[Q1] A) Choose the correct answer:

(1) The distant between two straight line $Y - 3 = 0$, $Y + 2 = 0$ is Length unit

- a) 1 b) 2 c) 3 d) 5

(2) The perimeter of triangle is bounded with lines $X = 0$, $Y = 0$, $4X + 3Y = 12$ equals Length unit

- a) 6 b) 12 c) 30 d) 60

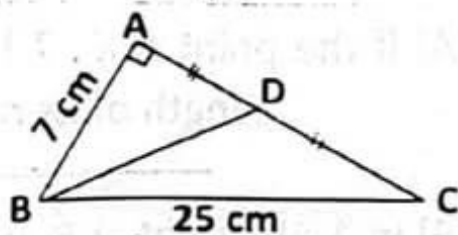
(3) If $\cos X = \frac{\sqrt{3}}{2}$ where $\frac{x}{2}$ acute angle , then $\sin 2X = \dots\dots\dots$

- a) 1 b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{1}{\sqrt{2}}$

[B] In the opposite figure:

$\overline{AB} \perp \overline{AC}$, $AB = 7$ cm , $BC = 25$ cm

$AD = DC$, Find: $\tan C + \frac{1}{\tan(\angle ABD)}$



[Q2] Choose the correct answer:

(1) The slope of straight line which make positive angle θ with the positive direction of X-axis is

- a) $\sin \theta$ b) $\cos \theta$ c) $\frac{\sin \theta}{\cos \theta}$ d) $\frac{\cos \theta}{\sin \theta}$

(2) In the opposite figure:

The value of $a = \dots\dots\dots$

- a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{\sqrt{3}}$
c) $\sqrt{2}$ d) $\sqrt{3}$



(3) The slope of straight line $3Y = Kx - 5$ and passes $(20, 5)$ is

- a) -1 b) 1 c) -2 d) $\frac{1}{3}$

[B] Find the equation of straight line passes through the point $(-1, -3)$ and perpendicular on the line passes through $(5, 6)$, $(3, 7)$

GEOMETRY – MODEL NO (4)**[Q1] A) Choose the correct answer:**

(1) Straight line passing through $(3, 4)$ and parallel to Y-axis is.....□

- a) $X = 3$ b) $X = 4$ c) $Y = 3$ d) $Y = 4$

(2) A circle its center is origin point and its radius 2 units, which of the following points belong to the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

(3) In $\triangle ABC$, if $\tan A = 2 + \sqrt{3}$, $\tan B = 2 - \sqrt{3}$, then $m(\angle C) = \dots\dots^\circ$

- a) 60 b) 90 c) 100 d) 120

[B] $\triangle ABC$, $A(2, 1)$, $B(2, 5)$, $C(3, 4)$, D is midpoint of \overline{AB} , draw $\overline{DE} \parallel \overline{BC}$ and cut \overline{AC} in E. Find equation of \overline{DE}

[Q2] Choose the correct answer:

(1) If the two lines $Y = aX + b$, $Y = CX + D$ are perpendicular, then
..... = -1

- a) $A \times D$ b) $A \times C$ c) $B \times C$ d) $B \times D$

(2) If $\sin X = 2 \sin 30^\circ \cos 60^\circ$, then $X = \dots\dots\dots^\circ$

- a) 30 b) 45 c) 60 d) 75

(3) The distant between $(2, 4)$ and straight line $Y + 2 = 0$ isunits

- a) 2 b) 4 c) 6 d) 8

[B] ABCD is a trapezium, $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 3$ cm ,
 $AD = 6$ cm , $BC = 10$ cm

Prove that: $\cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$

GEOMETRY – MODEL NO (5)**[Q1] A) Choose the correct answer:**(1) The slopes of two parallel lines are $-\frac{2}{3}$, $\frac{K}{2}$, then $K = \dots$

- a) $-\frac{3}{4}$ b) $\frac{1}{3}$ c) 3 d) $-\frac{4}{3}$

(2) If $\tan (X + 10)^\circ = \sqrt{3}$, where $(X+10)$ is acute angle, then $X = \dots$

- a) 20 b) 40 c) 50 d) 70

(3) The area of triangle is bounded with lines $3X - 4Y = 12$, $X = 0$, $Y = 0$ equals square units

- a) 6 b) 7 c) 12 d) 15

[B] Find the equation of straight line passing through $(-1, 3)$, its slope is positive and cut two equal parts from two coordinate axes

[Q2] Choose the correct answer:(1) ABCD is a rhombus, $A(3,3)$, $C(-3,-3)$ then slope of $\overline{DB} = \dots$

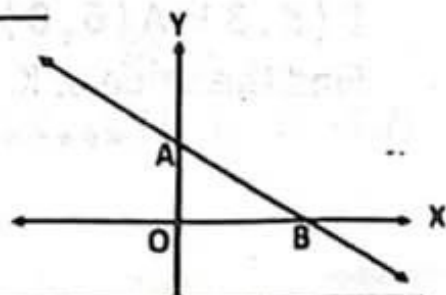
- a) -1 b) 1 c) $\frac{1}{3}$ d) $-\frac{1}{3}$

(2) If the $\triangle ABC$ is right at B, area of $\triangle ABC = \frac{1}{2} (BC)^2$, then $\tan A =$

- a) 1 b) $\sqrt{3}$ c) $\frac{1}{\sqrt{3}}$ d) $\frac{1}{2}$

(3) The equation of straight line parallel to X-axis and passing through $(5, 3)$ is

- a) $X = 3$ b) $X = 5$ c) $Y = 3$ d) $Y = 5$

[B] In the opposite figure: $A(0, 6)$, area of $\triangle OAB = 9$ square unitsFind equation of \overline{AB} 

GEOMETRY — MODEL NO (6)

[Q1] A) Choose the correct answer:

(1) If two lines: $3X - 4Y - 3 = 0$, $KY + 4X - 8 = 0$ are perpendicular, then the value of $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

(2) In $\triangle DEF$ right at E , which of the following is false?

- a) $\tan D \times \tan F = 1$ c) $\sin D = \cos F$
b) $\cos D = \sin F$ d) $\cos D = \sin E$

(3) If $\tan X = 2$, x is an acute angle, then $\sin X \cos X = \dots\dots\dots$

- a) 3 b) $\frac{1}{2}$ c) $\frac{1}{5}$ d) $\frac{2}{5}$

[B] Find the equation of straight line whose slope $\frac{2}{3}$ and passing through point $(3, -1)$

[Q2] Choose the correct answer:

(1) The straight line whose equation $3X + 4Y = 9$ is parallel to lines whose slope is $\dots\dots\dots$

- a) $\frac{3}{4}$ b) $\frac{4}{3}$ c) $\frac{1}{5}$ d) $\frac{2}{5}$

(2) \overline{AB} is a diameter in circle M , $A(-2,3)$, $B(6,-5)$, then M is $\dots\dots\dots$

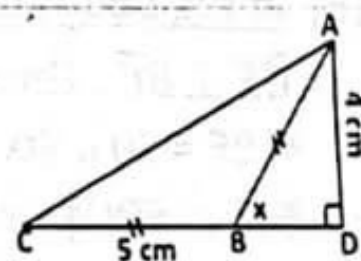
- a) $(4, 4)$ b) $(-2, 1)$ c) $(2, -1)$ d) $(-1, 2)$

(3) In the opposite figure:

$AD \perp DC$, $AB = BC = 5$ cm

$AD = 4$ cm, $m(\angle ABD) = X$, then $\tan \frac{x}{2} = \dots$

- a) $\frac{4}{5}$ b) $\frac{1}{2}$ c) $\frac{5}{4}$ d) 2



[B] If Axis of symmetry of CD passing through $A(6,m)$, $C(3,1)$, $D(-3,7)$ find the value of m

[A] In the opposite figure:

A rectangle $ABCD$ is shown with vertices A (bottom-left), B (bottom-right), C (top-right), and D (top-left). The side AD is labeled 4 cm and the side DC is labeled 9 cm . Point E is located on the side DC such that $DE = 4\text{ cm}$. A line segment EF is drawn from E perpendicular to DC , meeting AB at point F . Line segments AF and FB are drawn. The angle FAB is marked with an arc.

[B] In the opposite figure:

[04]

[A] Without using calculator find the value of X:

$$\cos X = \frac{\sin 60 \sin 30}{\tan 45 \sin 45}$$

[B] ABCD is a rectangle, A(1, 1), B(3, 3), C(0, -3), D(X, Y). find the value of X, Y

[05]

[A] ABC is a triangle right at B, prove that: $\sin^2 A + \cos^2 A = 1$

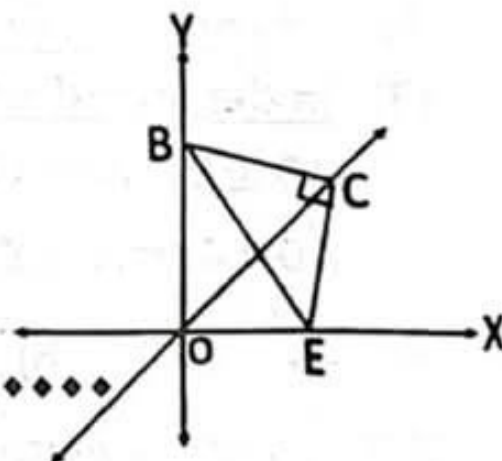
[B] In the opposite figure:

$\overline{CE} \perp \overline{BC}$, Equation of $\overline{(OC)}$ is $4X - 3Y = 0$

If BE = 20 units

$$m(\angle EOC) = m(\angle CBE)$$

Find length of \overline{BC}



End of the questions

GEOMETRY – MODEL No (7)

[Q1] A) Choose the correct answer:

(1) If point $(K, 2K)$ lies on straight line $2X + Y = 8$, then $K = \dots\dots\dots$

- a) -2 b) 1 c) 2 d) 3

(2) If $\sin 2X = \frac{\sqrt{3}}{2}$, $2X$ is acute angle, then $X = \dots\dots\dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(3) The distance between two lines $X + 3 = 0$, $X - 2 = 0$ equals.....

- a) 3 b) 4 c) 5 d) 6

[B] If the point $(5, 2)$ is midpoint of \overline{AB} , $A(x, 7)$, $B(-4, y)$
Find $X + Y$

[Q2] Choose the correct answer:

(1) In $\triangle ABC$, if $m(\angle A) : m(\angle B) : m(\angle C) = 3 : 4 : 5$

Then $\cos B = \dots\dots\dots$

- a) Zero b) $\frac{1}{2}$ c) 1 d) $\frac{\sqrt{3}}{2}$

(2) The equation of straight line passing through $(-2, K)$ and parallel to X-axis is

- a) $X = -2$ b) $Y = -2$ c) $X = K$ d) $Y = K$

(3) The straight line which passes through $(-1, -1)$, $(4, 4)$, make a positive angle with positive direction of X-axis of measure

- a) 30 b) 45 c) 60 d) 135

[B] $\triangle ABC$, $A(3, 2)$, $B(4, -5)$, $C(0, -2)$, \overline{AD} is a median.
Find equation of \overline{AD}

[03]

[A] Find the value of X : $X \sin^2 45 = \sin 30 \cos 60 + \cos 30 \sin 60$

[B] Prove that the points $A(5, 3)$, $B(3, -2)$, $C(-2, -4)$ are vertices of an obtuse triangle at B , then find coordinate of point D which make the figure $ABCD$ is a rhombus and its area?

[04]

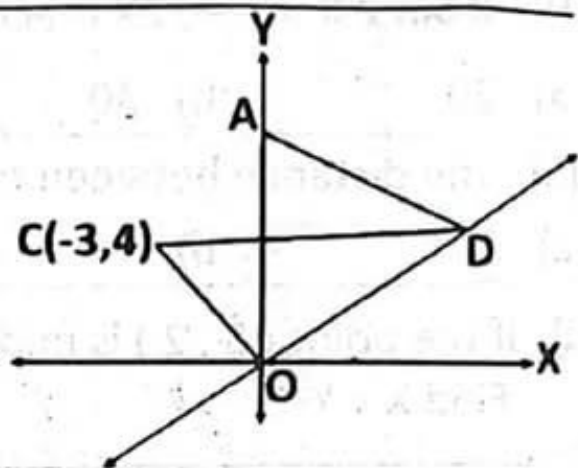
[A] **In the opposite figure:**

Equation of \overrightarrow{OC} is $Y = 2X$, $C(-3, 4)$

If the area of $\triangle AOD = \text{area of } \triangle COD$

① Find coordinate of point A .

② Find equation of \overrightarrow{AC}

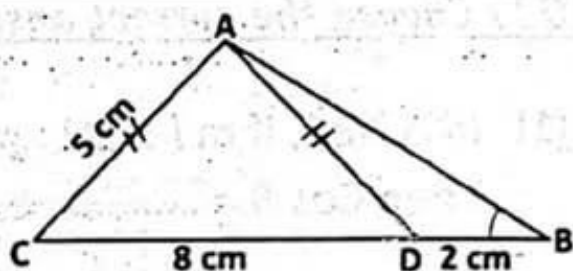


[B] **In the opposite figure:**

$\triangle ABC$, $D \in AC$, $AD = AC = 5 \text{ cm}$,

$BD = 2 \text{ cm}$, $CD = 8 \text{ cm}$

Find: $\sin^2 B + \cos^2 C$

**[05]**

[A] $\triangle ABC$ is right at B , $2AB = \sqrt{3} AC$, find:

① Trigonometric ratio of $\angle C$

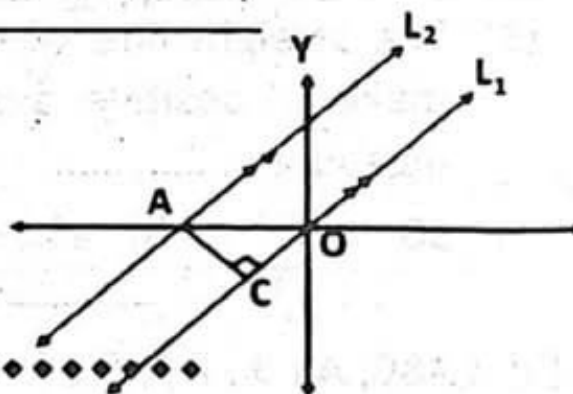
② $m(\angle A)$

[B] **In the opposite figure:**

Equation of L_1 is $Y = X$.

$L_1 \parallel L_2$, $AC \perp L_1$, $AC = 3\sqrt{2}$ units

Find the equation of L_2



.....

End of the questions

GEOMETRY – MODEL NO (8)**[Q1] A) Choose the correct answer:**(1) The distant between $(L, -4)$ and Y-axis is units, $L \in \mathbb{R}$

- a) 4 b) L c) -4 d) $|L|$

(2) If $\sin X = 2 \cos 60 \sin 30$, X is an acute angle, then $X = \dots\dots\dots$

- a) 30 b) 60 c) 45 d) 75

(3) If the two lines $3X - 4Y - 3 = 0$, $3X + KY - 8 = 0$ are perpendicular, then $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

[B] ABCD is a rhombus, $A(1, 3)$, $C(7, 9)$. Find equation of \overline{BD} **[Q2] Choose the correct answer:**

(1) A circle its center is origin point, its radius is 2 units, which of the following points lies on the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

(2) $\triangle ABC$ is right at B, $3AC = 5BC$, then $\tan A = \dots\dots\dots$

- a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

(3) The equation $2X - 3Y - 6 = 0$ cut from Y-axis part ofunits

- a) -6 b) -2 c) $\frac{2}{3}$ d) 2

[B] ABCD is an isosceles trapezium, $\overline{AD} \parallel \overline{BC}$, $AD = 4 \text{ cm}$, $AB = 5 \text{ cm}$, $BC = 12 \text{ cm}$ Prove that: $\frac{5 \tan B \cos C}{\sin^2 C + \cos^2 B} = 3$

GEOMETRY – MODEL No (9)**[Q1] A) Choose the correct answer:**(1) If $m(\angle A) = 75$, $\sin B = \cos B$, B acute angle, then $m(\angle C) = \dots^\circ$

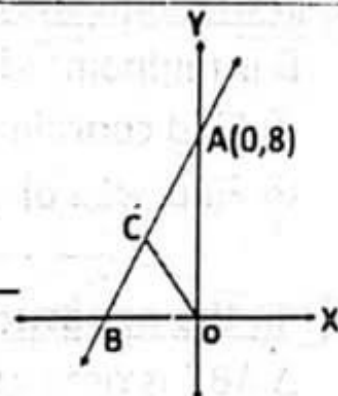
- a) 45 b) 60 c) 75 d) 120

(2) If $\triangle ABC$ is an isosceles triangle right at C , then $\tan A = \dots$

- a) $\frac{1}{3}$ b) $\sqrt{3}$ c) 1 d) -1

(3) If $\overline{AB} \perp \overline{CD}$, slope of $\overline{AB} = \text{zero}$, then slope of \overline{CD} is

- a) 1 b) -1 c) Zero d) Undefined

[B] In the opposite figure:O is origin point, $A(0,8)$,Area of $\triangle AOC = 4$ square units,If $AB = 3 AC$, find equation of AB **[Q2] Choose the correct answer:**(1) If $\cos 3X = \frac{1}{2}$, $3X$ is an acute angle, then $X = \dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(2) The length of radius of the circle of center $(0, 0)$ and passes through $(3, 4)$ equals Units

- a) 7 b) 1 c) 12 d) 5

(3) The measure of exterior angle of an equilateral triangle = \dots°

- a) 60 b) 90 c) 120 d) 80

[B] Without using calculator find the value of X :

$$2 \sin X = \tan^2 60 - 2 \tan 45$$

[03]

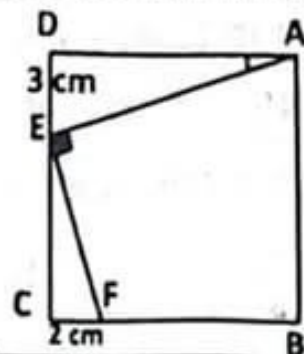
- [A] ABCD is a quadrilateral, $A(0, 6)$, $B(-1, 3)$, $C(5, 1)$, $D(6, 4)$
 prove by using the slope that ABCD is a rectangle and find its area

[B] **In the opposite figure:**

ABCD is a square, $E \in \overline{DC}$, $F \in \overline{BC}$

If $DE = 3 \text{ cm}$, $FC = 2 \text{ cm}$

Find $\tan(\angle DAE)$.

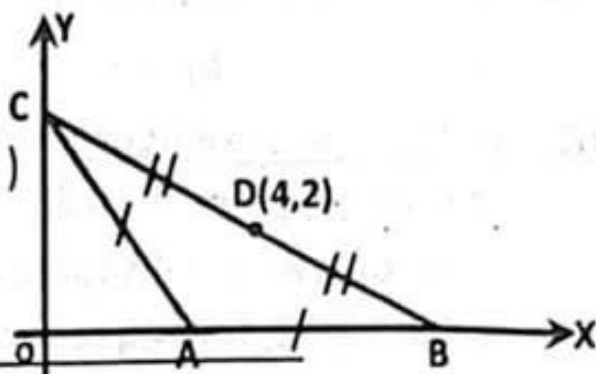
**[04]**

[A] **In the opposite figure:**

D is midpoint of \overline{BC} , $AB = AC$, $D(4, 2)$

① Find coordinate of A

② Find area of $\triangle ABC$



[B] **In the opposite figure:**

$\triangle ABC$ is right at B, $7 \tan A - 24 = 0$. Find the value of:

$$1 - \tan A \sin C$$

[05]

- [A] If the point $A(3, X)$, $B(4, 1)$, $C(5, 3)$ are collinear.

Find the value of X

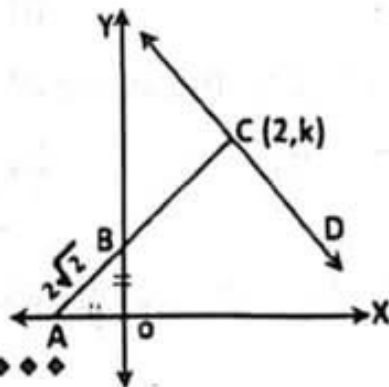
[B] **In the opposite figure:**

O is an origin point, $OA = OB$

$AB = 2$ units, $C(2, k)$

$\overline{AB} \perp \overline{CD}$. ① Find the value of K

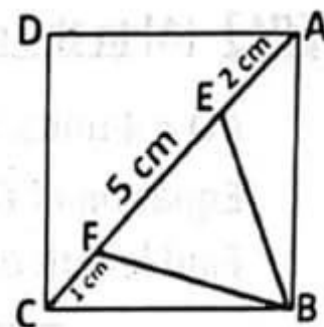
② Find the equation of \overline{CD}



.....
End of the questions

GEOMETRY – MODEL NO (10)**[Q1] A) Choose the correct answer:**

- (1) If $m(\angle C) = 85$, $\sin B = \cos B$, B acute angle, then $m(\angle A) = \dots^\circ$
 a) 30 b) 45 c) 50 d) 60
- (2) Area of triangle whose is bounded with straight lines $X=0$, $Y=0$, $3X+2Y=12$ issquare units
 a) 6 b) 12 c) 4 d) 5
- (3) The slope of straight line passing through $(1, Y)$, $(3, 4)$ equal $\tan 45$, then $Y = \dots$
 a) 1 b) 2 c) -1 d) 4

[B] In the opposite figure:ABCD is a square, $E, F \in \overline{AC}$, $AE = 2$ cm, $CF = 1$ cm, $EF = 5$ cmFind the value of: $\tan(\angle BEF) + \tan(\angle BFE)$ **[Q2] Choose the correct answer:** ☐

- (1) The straight line $aX + (2 - a)Y = 5$ is parallel to straight line whose passing through $(1, 4)$, $(3, 5)$, then the value of $a = \dots$
 a) 3 b) -2 c) 6 d) 4
- (2) $\triangle ABC$, $2m(\angle C) = m(\angle A) + m(\angle B)$, then $m(\angle C) = \dots$
 a) 30 b) 60 c) 45 d) 90
- (3) The straight line $\frac{x}{2} - \frac{y}{3} = 6$ cut from X -axis part = Units
 a) 3 b) 2 c) 6 d) 12

[B] \overline{AB} is diameter in circle M , $B(8, 11)$, $M(5, 7)$ Find:

① Circumference of circle

② Equation of perpendicular straight line on \overline{AB} at A

حمل الآن

مجاناً وحصرياً

امتحانات رقم (3)

الترم الاول



ALGEBRA – MODEL No**1****Q1) A) Choose the correct answer:**

(1) The third proportion between 3 , 6 is

- a) $\frac{1}{2}$ b) 2 c) 9 d) 12

(2) If $Y = 4 X$, then.....

- a) $Y \propto \frac{1}{x}$ b) $X \propto \frac{1}{y}$ c) $Y \propto X$ d) Other wise

(3) $\mathcal{F}(x) = X (3 X + 2)^2$ is a function of Degree

- a) First b) Second c) Third d) fourth

B): If $X = \{ 1 , 3 , 5 \}$, $Y = \{ 4 , 5 \}$, Find $(X \cap Y) \times (X \cup Y)$ **Q2) A) Choose the correct answer:**(1) If $X = \{ 7 \}$, $Y = \{ 5 \}$, then $n (X \times Y) =$

- a) Zero b) 1 c) 2 d) 35

(2) The difference between the greatest value and the smallest value of a set of data is

- a) The mean b) The range c) The median d) The mode

(3) The arithmetic mean for the values 7 , 3 , 6 , 9 , 5 equal

- a) 3 b) 4 c) 6 d) 12

B): If B is a middle proportion between A , C , prove that:

$$\frac{A^2 + B^2}{B^2 + C^2} = \frac{A}{C}$$

Q3

A) If $X = \{ 1, 2, 4 \}$, $Y = \{ 4, 5, 2, 7 \}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $a + b = 6$ " for $a \in X$, $b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Prove that R is a function and write its range
-

B) If $\frac{X}{2} = \frac{Y}{3} = \frac{Y-X}{5k}$, find the value of k ?

Q4

A) If $Y \propto \frac{1}{X}$ and $Y = 8$ when $X = 3$. Find the relation between Y and X then find value of Y when $X = 4$.

B) Find the standard deviation for the values 12, 13, 16, 18, 21

Q5

A) If the straight line which represents $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}$, $\mathcal{F}(x) = 6x + K$ cut Y -axis at point $(m, 3)$, find the value of m, K .

B) Graph the function $\mathcal{F}(x) = (x - 2)^2$ where $x \in [-1, 5]$ and from graph find:

- ① The coordinates of vertex
- ② The maximum value of function
- ③ The equation of the axis of symmetry

— ◆ ◆ —

End of the questions

ALGEBRA – MODEL No 2**Q1) A) Choose the correct answer:**

(1) Which of the following from the dispersion measurement?

- a) Median b) Mean c) Range d) Mode

(2) If $X \propto Y$, $X = \dots\dots\dots$, where $m \neq 0$

- a) $m + Y$ b) $\frac{m}{y}$ c) $\frac{1}{m y}$ d) $m \times y$

(3) For any two sets A , B, the set $\{ (x,y) : x \in A , y \in B \}$ represents

- a) $n (A \times B)$ b) $A \times B$ c) $n (B \times A)$ d) $B \times A$

B): Find the arithmetic mean and the standard deviation for the set of values: 7 , 12 , 6 , 15 , 10

Q2) A) Choose the correct answer:

(1) Which value of a make the range of the set of the following values **53 , a , 85 , 57 , 60 , 55** equal **9** :

- a) 63 b) 61 c) 51 d) 50

(2) If $3 , x , \frac{1}{y}$, are proportional quantities, then $\dots\dots\dots = 3$

- a) $X^2 Y$ b) Y c) $X Y$ d) $\frac{x^2}{y}$

(3) If $\mathcal{F}(x) = n X^2 + 2 X^n - 3$, then the possible value of n which make $\mathcal{F}(x)$ if function of second degree is $\dots\dots\dots$

- a) $\{2, 3\}$ b) $\{1, -1\}$ c) $\{2, 1, 0\}$ d) $\{2, 1\}$

B): If $Y \propto \frac{1}{x}$, and $Y = 6$ when $X = 2$, find the value of X when $Y = \frac{3}{4}$

Q3

A) If $\frac{x}{5} = \frac{y}{3} = \frac{z}{6}$, prove that: $\frac{2x + y - z}{7} = \frac{y+z}{9}$

B) If $X = \{1, 4, 7\}$, $Y = \{-1, 1, 4, 7\}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $a + |b| = 6$ " for $a \in X, b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? Give reason.
-

Q4

A) If a, b, c, d are in continued proportion,

Prove That: $\frac{c^2 + a}{b} = \frac{d^2 + c}{d}$

B) Graph the function $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}, \mathcal{F}(x) = 2x - 4$

- ① From the graph find the intersection points with X-axis and Y-axis
 - ② If: $\mathcal{F}(a) = 20$, find the value of a
-

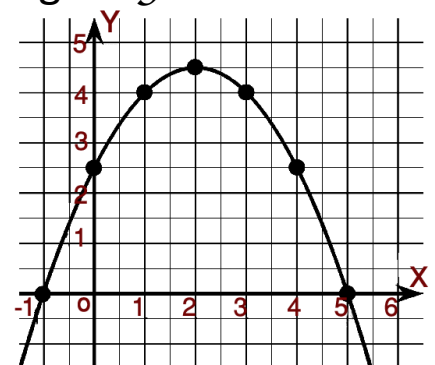
Q5

- The curve represents a function of second degree \mathcal{F} :

- ① Write the domain of \mathcal{F}

Use the graph to find:

- ② The range of the function \mathcal{F}
- ③ The equation of the line of symmetry
- ④ The maximum value of \mathcal{F}
- ⑤ The value of $\mathcal{F}(1)$
- ⑥ If $\mathcal{F}(x) = a(x - 2)^2 + K$, then find the numerical value of $a + k$



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No 3**3****Q1) A) Choose the correct answer:**

(1) The difference between the greatest and smallest value is

- a) Median b) Mean c) Range d) Mode

(2) If $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}$, $\mathcal{F}(x) = 3$, then $\frac{\mathcal{F}(6)}{\mathcal{F}(0)} = \dots\dots\dots$

- a) 6 b) 1 c) 3 d) Undefined

(3) Which of the following represents inverse variation?

- a) $Y = X$ b) $Y = X^2$ c) $XY^2 = 1$ d) $Y = \frac{3}{y}$

B): If $X = \{2, 3\}$, $Y = \{3, 4\}$, $Z = \{4, 5\}$, find:

① $Z \times (X \cap Y)$

② $(Z - Y) \times X$

Q2) A) Choose the correct answer:(1) If the point $(X + 1, X - 3)$ lies on X-axis, then $X =$

- a) -1 b) Zero c) -2 d) 3

(2) If $A(a, 4)$ satisfies the function $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}$, $\mathcal{F}(x) = 2X + b$, then $6a + 3b = \dots\dots\dots$

- a) 12 b) 9 c) 6 d) 3

(3) If $X \times Y = \{(1,2), (1,3), (1,4)\}$, then $n(X) + 2(Y^2) = \dots\dots\dots$

- a) 3 b) 4 c) 6 d) 10

B): If $X, 2, 4, 2Y$ are in continued proportion.
Find the value of $X + Y$

Q3

A) If $X = \{-2, -1, 0, 1\}$, $Y = \{-1, 0, 1, 2, 4\}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $b = a^2$ " for $a \in X$, $b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
- ② Is \mathcal{R} function or not? Give reason.

B) The following values for five students in exam: **8, 9, 6, 12, 10**
Find: ① The arithmetic mean ② The standard deviation

Q4

A) Graph the function $\mathcal{F}(x) = x(x - 2) - 3$ where $x \in [-2, 4]$ and from graph find:

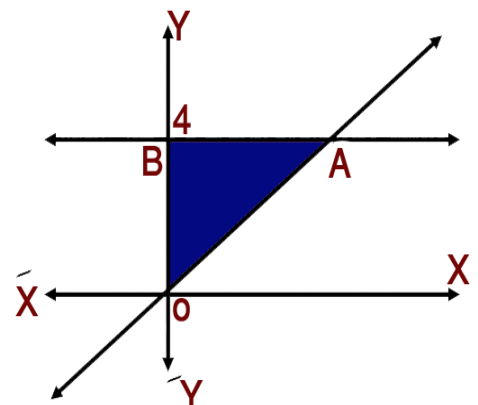
- ① The coordinates of vertex
- ② The maximum or minimum value of function
- ③ The equation of the axis of symmetry

B) If $\frac{a+b}{5} = \frac{b+c}{3} = \frac{c+a}{6}$, prove that: $\frac{a+b+c}{a-c} = \frac{7}{2}$

Q5

A) If $Y = 2 + b$, where $b \propto X$ and $X = 1$ when $Y = 5$, find the relation between X , Y then find the value of Y when $X = 2$

B) The opposite figure shows the \overrightarrow{AB} which represents the function $\mathcal{F}(x) = 4$, if \overrightarrow{OA} represents the linear function $G(x) = nx + k$ and the area of the triangle ABO equals 4 square units, then find the value of n , k where O is the origin point.



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End of the questions

ALGEBRA – MODEL No 4**4****Q1) A) Choose the correct answer:**

(1) If $X = \{ 1, 3, 5 \}$, R is function on X , $R = \{ (a,3), (b,1), (1,5) \}$
then $a + b = \dots\dots\dots$

- a) 4 b) 6 c) 8 d) 2

(2) If $(L - 3, 2)$ lies in first quadrant, then L may be equals

- a) -3 b) 2 c) 7 d) Zero

(3) If $2a = 3b$, then $\frac{3a}{2b} = \dots\dots\dots$

- a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) $\frac{9}{4}$ d) $\frac{4}{9}$

B): If $X^2 Y^2 - 4XY = -4$, prove that X is varies inverse with Y .

Q2) A) Choose the correct answer:

(1) The simplest dispersion measurement is

- a) Mean b) Median c) Standard deviation d) range

(2) If $(a, 2) \in$ Straight line $Y = 3X - 4$, then $a = \dots\dots\dots$

- a) 2 b) 3 c) 4 d) 7

(3) If $n(x) = 2$, $n(X \times Y) = 8$, then $n(Y^2) = \dots\dots\dots$

- a) 4 b) 2 c) 16 d) 8

B): Find the number which if it added to the two terms of the ratio **7:11** it will be **2 : 3**.

Q3

A) Find the standard deviation for the values: 2 , 5 , 6 , 8 , 9

B) The straight line which represents $\mathcal{F} : \mathcal{R} \rightarrow \mathcal{R}$ where $\mathcal{F}(x) = 3x + a$ cut Y-axis at the point (b , 7). **Find** the value of $2a - 5b$

Q4

A) If $\frac{a}{4} = \frac{b}{5} = \frac{c}{3}$, **prove that:** $\frac{a-b+c}{a+b-c} = \frac{1}{3}$

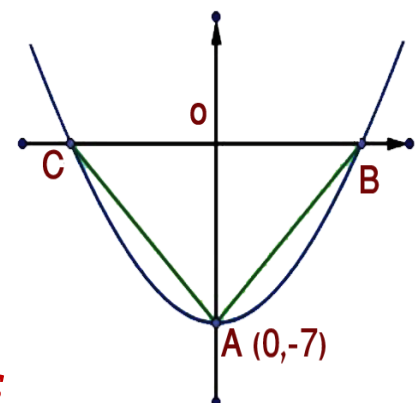
B) If $X = \{ 1 , 2 \}$, $Y = \{ 0 , 2 , 3 \}$ and \mathcal{R} is a relation form X to Y where **a \mathcal{R} b** means "**a + b is odd number**" for $a \in X$, $b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? Give reason.
-

Q5

A) If $(3 - x , Y + 2) = (- 4 , 4)$, **Find** the value of $\sqrt{x + y}$

B) The opposite figure represents the curve of the function $\mathcal{F} : \mathcal{F}(x) = Lx^2 - 7$, the area of the $\triangle ABC = 21$ square units, **A (0 , -7)**. **Find** the coordinate of the point B, and then **find** the value of L.



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**5****Q1) A) Choose the correct answer:**

(1) If $5X = 9Y$, then $\frac{3x}{2y} = \dots\dots\dots$

- a) $27 : 10$ b) $9 : 5$ c) $5 : 9$ d) $81 : 25$

(2) The opposite figure represents a curve of quadratic function, if point A $(-4, 0)$, then the equation of line of symmetry is $X = \dots\dots$

- a) 1 b) -1 c) -2 d) Zero

(3) The number that it is added to each of the numbers **1, 3, 6** it becomes proportional is $\dots\dots\dots$

- a) 4 b) 3 c) 2 d) 1

B): If B is mean proportional between A, C.

Prove that: $\frac{a^2}{b^2} + \frac{b^2}{c^2} = \frac{2a}{c}$

Q2) A) Choose the correct answer:

(1) If $\mathcal{F}(X + 3) = X - 3$, then $\mathcal{F}(7) = \dots\dots\dots$

- a) 4 b) 1 c) 7 d) 10

(2) If $\sum (X - \bar{X})^2 = 36$ for nine of the values, then the standard deviation equals $\dots\dots\dots$

- a) 2 b) 18 c) 27 d) 4

(3) If $\mathcal{F}(x) = 3$, then $\mathcal{F}(2) - \mathcal{F}(7) = \dots\dots\dots$

- a) 5 b) -5 c) Zero d) -4

B): If $X = \{4, 5, 7\}$ and \mathcal{R} is function on X and $\mathcal{R} = \{(a, 5), (b, 5), (4, 7)\}$

① Find the numerical value of **$3a + 2b$**

② The range of the function

Q3

A) If $\frac{a}{4x+y} = \frac{b}{x-4y}$, prove that: $\frac{a+b}{5x-3y} = \frac{a-b}{3x+5y}$

B) Find the standard deviation for the values: 12 , 13 ,16 , 18 , 21

Q4

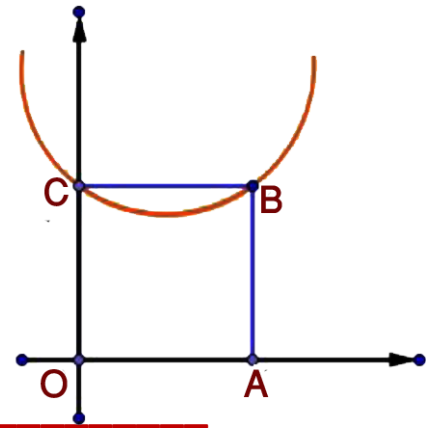
A) The opposite figure:

Represents the quadratic function

$$f: f(x) = x^2 - (K-2)x - K + 4$$

If ABCO is a square

Find the value of K



B) If $Y = 1 + b$ where b varies inverse with square of X , and $X = 1$ where $Y = 5$. **Find** the relation between X , Y then **find** the value of Y when $X = 2$

Q5

A) If $f(x) = a + x^2$, $g(x) = c$ are two polynomial function where a, c are two constant and $3f(2) + 3g(x) = 6$, **find** the numerical value of $2f(0) + 2g(7)$

B) If $X = \{3, 5, 7\}$, $Y = \{x : x \in \mathbb{N}, 10 < x < 30\}$ and the function f from $X \rightarrow Y$ where $f = \{(3,9), (5,15), (7,21)\}$

Find: ① The domain of f ② Write the rule of f

◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No

6

Q1) A) Choose the correct answer:(1) If the point $(X-3, 2-X)$ lies in fourth quadrant, then $X = \dots\dots$

- a) 4 b) 3 c) 2 d) 1

(2) If $\mathcal{F}(x) = KX + 8$, $\mathcal{F}(2) = \text{zero}$, then $K = \dots\dots\dots$

- a) 8 b) 6 c) 4 d) -4

(3) If $a, 2, 4, b$ are in continued proportion, then $a + b = \dots\dots\dots$

- a) 2 b) 4 c) 6 d) 9

B): If b is mean proportion between a, c

Prove that: $\frac{2c^2 - 3b^2}{2b^2 - 3a^2} = \frac{c}{a}$

Q2) A) Choose the correct answer:(1) If $Y \propto X$, $Y \propto \frac{1}{Z}$, then $Y \propto \dots\dots\dots$

- a) XZ b) $\frac{Z}{X}$ c) $\frac{X}{Z}$ d) X^2Z

(2) The standard deviation of the values $5, 5, 5, 5$ is

- a) Zero b) 5 c) 6 d) 2

(3) The function $F(x) = X^2 - (X-3)^2$ of degree

- a) Zero b) First c) Second d) Third

B): The point $(-1, 2)$ is the vertex of the curve $\mathcal{F}(x) = aX^2 - 6x + c$.
find the value of C

Q3

A) If $3a = 4b = 6c$, find $a : b : c$ then find the numerical value of the expression $\frac{3a+2b}{a+4c}$

B) If $X = \{-2, -1, 0, 1, 2\}$, and \mathcal{R} is a relation on X where $a \mathcal{R} b$ means "**a is additive invers of b**" for $a, b \in X$:

① Write \mathcal{R} and represents it by arrow diagram

② Is \mathcal{R} function or not? Give reason.

Q4

A) If $X = Z + 8$, Z varies inverse with Y and $Z = 2$ when $Y = 3$. **Find** the relation between X, Y then **find** the value of Y when $X = 3$

B) If $\mathcal{F}(x) = 2x + 5$, $\mathcal{G}(x) = x - 6$. **Prove that** $\mathcal{F}(2) + 3\mathcal{G}(3) = 0$

Q5

A) Find the arithmetic mean and standard deviation for the values **5, 7, 8, 9, 6**

B) If $(X - 2, 2^{Y-1}) = (3, 1)$, find the value of X, Y

◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**7****Q1) A) Choose the correct answer:**

(1) The range of the values 7 , 3 , 6 , 9 , 5 equals

- a) 3 b) 4 c) 6 d) 12

(2) $a : b = a^2 : \dots\dots\dots$, $a \neq b \neq \text{zero}$

- a)
- b^2
- b)
- $a b$
- c)
- $a^2 b$
- d)
- $a b^2$

(3) If $X = [0,5]$, $Y = [-3,2[$, then $(-2,4) \in \dots\dots\dots$

- a)
- X^2
- b)
- Y^2
- c)
- $X \times Y$
- d)
- $Y \times X$

B): If b is mean proportion between a , cProve that: $\frac{a^2 + b^2}{b^2 + c^2} = \frac{a}{c}$ **Q2) A) Choose the correct answer:**

(1) The relation represents inverse variation between Y , X is

- a)
- $Y = 5 X$
- b)
- $\frac{x}{5} = \frac{4}{y}$
- c)
- $\frac{x}{5} = \frac{y}{3}$
- d)
- $Y = X + 3$

(2) If $X = \{1,2,3\}$, $R = \{ (a , b) : a \in X , b \in Y \}$ then number of elements in R equals

- a) 12 b) 9 c) 6 d) 3

(3) If the curve of the function $\mathcal{F} : \mathcal{F} (x) = x^2 + b x - 3$ cut form negative part of X-axis only one units, then **b** =

- a) b) c) d)

B): If $(\sqrt{x-1} , 11) = (4 , Y + 3)$, find the value of $\sqrt{x+y}$

Q3

A) If $\mathcal{F}: \mathcal{F}(x) = X^2 + bX + c$, and $F(2) = 2$ when $X \in \{0, 3\}$. **Find** the value of b, c .

B) Find the standard deviation for the values **5, 7, 8, 14, 16**

Q4

A) If $X = \{-1, 0, 1\}$, and \mathcal{R} is a relation on X where **a \mathcal{R} b** means " **$b = a^2$** " for $a, b \in X$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? If R is a function, find its range.
-

B) If $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, **prove that:** $\frac{2y-z}{3x-2y+z} = \frac{1}{2}$

Q5

A) If $\mathcal{F}: \mathcal{F}(x) = aX^2 + 5X + 7$, if linear function, **find** the value of a then find $\mathcal{F}(-1)$.

B) If the weight of a body on the moon (**W**) is directly proportional with its weight on the ground (**R**), if the body weight **84 kg**, on the ground and its weight on the moon is **14 kg**. What will its weight be on the moon if its weight on the ground **144 kg**?

◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**8****Q1) A) Choose the correct answer:**(1) If $X = \{12\}$, then $n(X^2) = \dots\dots\dots$

- a) 1 b) 2 c) 4 d) 144

(2) If $(a, a) \in \mathcal{F}$, $\mathcal{F}(x) = 2x - 3$, then $a = \dots\dots\dots$

- a) Zero b) 1 c) 2 d) 3

(3) If the range of the values 7, 3, 6, K, 5 is 6, then $K = \dots\dots\dots$

- a) 3 b) 6 c) 9 d) 12

B): If $X = \{3, 4\}$, $Y = \{4, 5\}$, $Z = \{6, 5\}$, find :

① $X \times (Y \cap Z)$

② $(X - Y) \times Z$

Q2) A) Choose the correct answer:(1) If $X = [-2, 2[$, $Y = [0, 4]$, then $(-2, -1) \in \dots\dots\dots$

- a) X^2 b) Y^2 c) $X \times Y$ d) $Y \times X$

(2) If the quantities 5a, 2, 3b, 7 are proportional, then $\frac{a}{b} = \dots\dots\dots$

- a) $\frac{3}{7}$ b) $\frac{6}{35}$ c) $\frac{3}{5}$ d) $\frac{3}{2}$

(3) If $Y - X = \frac{1}{x} - \frac{1}{y}$, where $X \neq Y$ zero, then $\dots\dots\dots$

- a) $Y \propto \frac{1}{x}$ b) $Y \propto \frac{1}{x^2}$ c) $Y \propto X$ d) $Y \propto X + 1$

B): If a, b, c, d are in continued proportion, prove that:

$$\Rightarrow \frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$$

Q3

A) If $X = \{-1, 1, 2, \frac{1}{2}\}$ and R is relation on X where $a \mathcal{R} b$ means " $b = a^{-1}$ " for $a, b \in X$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? If R is a function, find its range.
-

B) Find the standard deviation for the values 5, 7, 8, 9, 6

Q4

A) If the value of speed (V) that water passes through a hose nuzzle inversely changes with the square of the hose radius length (r), and $V = 5$ cm/s when $r = 3$ cm. find V when $r = 2.5$ cm

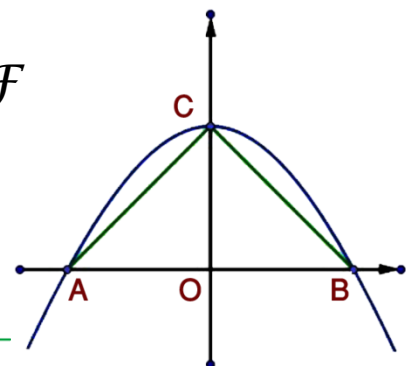
B) If $\mathcal{F}(x) = aX + b$, and $\mathcal{F}(a) = b$, find the numerical value of $ab^2 + 5$

Q5

A) If $\frac{a+b}{7} = \frac{b+c}{5} = \frac{c+a}{6}$, find $a : b : c$

B) The opposite figure represents function \mathcal{F}
Where $\mathcal{F}(x) = 5 - x^2$, **find**:

- ① The coordinates of points B, C
- ② Area of $\triangle ABC$



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**9****Q1) A) Choose the correct answer:**(1) If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $X - Y = \dots\dots\dots$

- a) 1 b) -1 c) ± 1 d) Zero

(2) If $\mathcal{F}(x) = KX + 8$, $\mathcal{F}(2) = \text{zero}$, then $K = \dots\dots\dots$

- a) 8 b) 1 c) 3 d) -1

(3) If the standard deviation for some of values equals 2, and the number of these values is 2, then $\sum (x - \bar{x})^2 = \dots\dots\dots$

- a) 12 b) 18 c) 24 d) 36

B): If $\frac{a}{b-a} = \frac{c}{d-c}$,Prove that a, b, c, d are proportional quantities**Q2) A) Choose the correct answer:**(1) If $\frac{a}{3} = \frac{b}{2} = \frac{2a+b}{x}$, then $x = \dots\dots\dots$

- a) 8 b) 4 c) 3 d) 1

(2) If $3, X, \frac{1}{y}$ are in continued proportional, then $Y \propto \dots\dots\dots$

- a) X b) $\frac{1}{x}$ c) X^2 d) $\frac{1}{x^2}$

(3) The simplest dispersion measurement is $\dots\dots\dots$

- a) Range b) Median c) Mean d) Mode

B): Find the standard deviation for the values 6, 8, 10, 12, 14

Q3

A) If $X = \{ 1, 2, 3 \}$, $Y = \{ 1, 4, 9, 10 \}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $a = \sqrt{b}$ " for $a \in X$, $b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
- ② Prove that \mathcal{R} is a function and write its range

B) If the curve of function $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}$ where $\mathcal{F}(x) = m - x^2$ cut x-axis in the point $(-2, b)$, find the value of $F(x) = m^b + 2m$

Q4

A) Graph the function $\mathcal{F}(x) = (x - 2)^2$ where $x \in [0, 4]$ and from graph find:

- ① The equation of the axis of symmetry
- ② The maximum value of function

B) IF $Y = 5 + a$, $a \propto X$, find the relation between X , y where $a = 6$ when $X = 2$, then find X when $Y = 8$

Q5

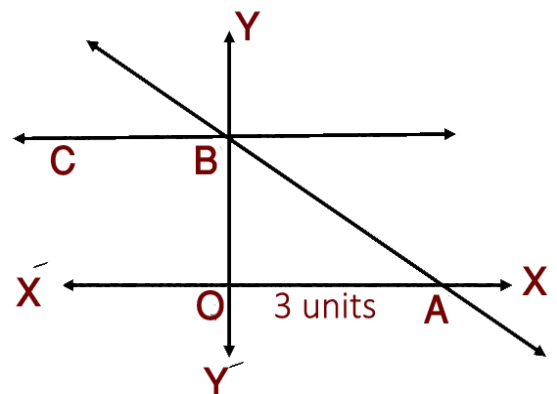
A) If A, b, C, D are in continued proportion, prove that:

$$\left(\frac{a+b}{b+c} \right)^3 = \frac{a}{d}$$

B) In the opposite figure:

The function \mathcal{F} represents by \overrightarrow{AB} ,
 $OA = 3$ units, the function $G: G(x) = 6$
 Represents by \overrightarrow{BC} .

- ① Find the rule of \mathcal{F}
- ② The value of $\mathcal{F}(6) + G(1)$



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**10****Q1) A) Choose the correct answer:**

(1) The range for the values 5 , 14 , 4 , 37 , 15 , 16 , 7 is

- a) 33 b) 32 c) 30 d) 22

(2) If $X = \{ 3 , 1 , 5 \}$ and \mathcal{R} is function on X where $\mathcal{R} = \{ (a,3) , (b,1) , (1,5) \}$, then the numerical value of $a + b = \dots$

- a) 4 b) 6 c) 8 d) 10

(3) If $b < 3$, then the point $(- 5 , b - 3)$ lies in quadrant

- a) First b) Second c) Third d) Fourth

B): If a , b , c , d are in continued proportion, prove that:

$$\Rightarrow \frac{a-d}{a+b+c} = \frac{a-2b+c}{a-b}$$

Q2) A) Choose the correct answer:(1) If $a , x , b , 2x$ are proportional, then $\frac{b}{a} = \dots\dots\dots$

- a)
- $\frac{3}{2}$
- b)
- $\frac{2}{3}$
- c) 3 d) 2

(2) The relation which represents direct variation between X , Y is ...

- a)
- $XY = 5$
- b)
- $\frac{x}{5} = \frac{y}{3}$
- c)
- $Y = X + 3$
- d)
- $\frac{x}{5} = \frac{4}{y}$

(3) If $\mathcal{F}(X - 4) = X + 3$, then $\mathcal{F}(3) = \dots\dots\dots$

- a) 5 b) 6 c) 10 d) 20

B): Find the arithmetic mean and the standard deviation for the values 7 , 12 , 6 , 15 , 10

Q3

A) If $X = \{-2, -1, 0, 1, 2\}$, $Y = \{4, 2, \frac{3}{2}, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $b = 2^a$ " for $a \in X, b \in Y$:

- ① Write \mathcal{R} and represents it by arrow diagram
- ② Prove that R is a function and write its range

B) If $\frac{x+y}{7} = \frac{y+z}{5} = \frac{x+z}{8}$, prove that: $\frac{x+y+z}{x-z} = 5$

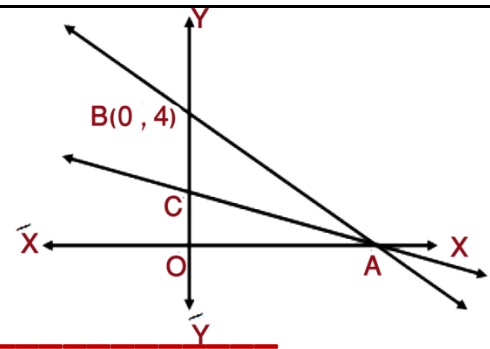
Q4

A) In the opposite figure:

\overrightarrow{AC} represents $\mathcal{F}(x) = 2 - \frac{2}{3}x$,

\overrightarrow{AB} represents $G(x) = Kx + m$

If $B(0, 4)$, find the value of k, m



B) If $2a = 3b = 4c$, find the value of $\frac{a^2 + b^2 + c^2}{a(b+c)}$

Q5

A) If $Y = Z + 5$, and Z varies inverse with X , $Y = 6$ when $X = 2$.

Find the relation between X, Y then Find value of Y at $X = 1$

B) In the opposite figure:

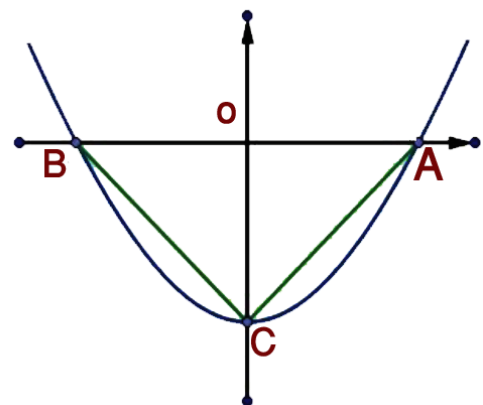
$\mathcal{F}: \mathcal{F}(x) = x^2 - K$, the triangle ABC

An equilateral triangle its area

Equals $9\sqrt{3}$ square units

Find: ① The value of K

② The coordinate of A, B



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**11****Q1) A) Choose the correct answer:**(1) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then $\frac{a}{d} = \dots\dots$

- a) 5×2^2 b) 40 c) 10 d) 2×5^3

(2) If $\{2\} \times \{x, y\} = \{(2, 4), (2, 3)\}$, then $X - Y = \dots\dots\dots$

- a) 1 b) -1 c) ± 1 d) Zero

(3) If $(|x|, 4) = (3, Y^2)$, and the point (x, y) lies in the fourth quadrant, then $X + Y = \dots\dots\dots$

- a) 7 b) 1 c) -1 d) -7

B): Find the arithmetic mean and the standard deviation for the values 14, 15, 20, 22, 24

Q2) A) Choose the correct answer:(1) If $3a = 2b = 4c$, then $a : b : c = \dots\dots\dots$

- a) 3 : 4 : 6 b) 3 : 6 : 4 c) 4 : 6 : 3 d) 4 : 3 : 6

(2) The relation which represents direct variation between X, Y is ...

- a) $XY = 5$ b) $\frac{x}{5} = \frac{y}{3}$ c) $Y = X + 3$ d) $\frac{x}{5} = \frac{4}{y}$

(3) Selecting a sample of layers of statistical society is called sample

- a) Random b) Class (layer) c) Deliberate d) bunch

B): If $X - Y = \{7\}$, $Y - X = \{4, 2\}$, $X \cap Y = \{6\}$, find:

① $(X - Y) \times Y$

② $(Y - X) \times X$

Q3

A) If $\frac{x+y}{25} = \frac{x-y}{11} = \frac{x+y-z}{8}$, prove that: $X : Y : Z = 18 : 7 : 17$

B) If the set of function $\mathcal{F} = \{ (0, 5), (2, 3), (3, 2), (4, 1), (1, 4) \}$

① Find the domain and range of \mathcal{F}

② Write the rule of \mathcal{F}

Q4

A) If B is mean proportional between A , C.

Prove that: $\frac{2c^2 - 3b^2}{2b^2 - 3a^2} = \frac{c^2}{b^2} = \frac{c}{a}$

B) If $\mathcal{F} : \mathcal{R} \rightarrow \mathcal{R}$ where $\mathcal{F}(x) = (a - 3)X^2 + bX + 5$ of first degree, $\mathcal{F}(3) = 11$, find the value of a , b

Q5

A) IF $Y = a - 9$, $Y \propto \frac{1}{x^2}$, and $a = 18$ at $X = \frac{3}{2}$, find the relation between X , y then find Y when $X = 1$

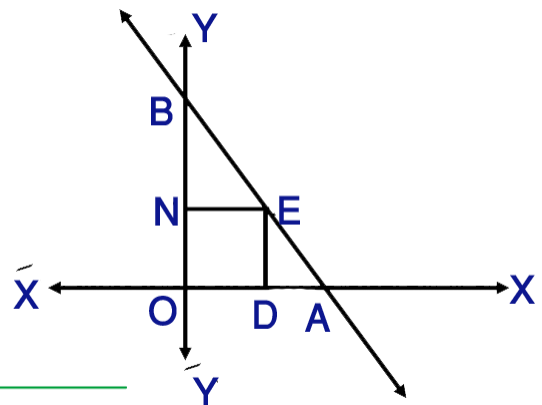
B) In the opposite figure:

\overrightarrow{AB} represent $\mathcal{F}(x) = KX + m$,

$A(3, 0)$, $B(0, 6)$, ODNE is square

Find: ① The rule of Function \mathcal{F}

② The area of Square ODEN



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**12****Q1) A) Choose the correct answer:**

(1) If the range of the values 2 , 7 , a , 6 is 8, $a > 0$, then $a = \dots\dots\dots$

- a) 4 b) 9 c) - 1 d) 10

(2) If $Y = 3X - 6$, then $Y \propto \dots\dots\dots$

- a) X b) 3X c) X - 2 d) X - 6

(3) If the point $(K^2 - 4, K)$ lies on the negative part from Y-axis, then the value of $K = \dots\dots\dots$

- a) ± 2 b) 4 c) - 2 d) 2

B): Find the arithmetic mean and the standard deviation for the values 8 , 9 , 7 , 6 , 5

Q2) A) Choose the correct answer:

(1) The maximum value of $F(x) = -2x^2 + 4x + 3$ is $\dots\dots\dots$

- a) 5 b) 1 c) 3 d) - 1

(2) If a , 3 , 9 , b are in continued proportion, then $a + b = \dots\dots\dots$

- a) 12 b) 26 c) 27 d) 28

(3) If $X = \{3, 1, 5\}$ and \mathcal{R} is function on X where

$\mathcal{R} = \{(a,3), (b,1), (1,5)\}$, then the numerical value of $a + b = \dots\dots\dots$

- a) 4 b) 6 c) 8 d) 10

B): If $\frac{x+y}{5} = \frac{y+z}{3} = \frac{x+z}{6}$, prove that: $\frac{x-z}{x+y+z} = \frac{2}{7}$

Q3

A) If $X = \{ 1, 2, 4, 6, 10 \}$ and \mathcal{R} is relation on X where $a \mathcal{R} b$ means "**a is multiple of b**" for $a, b \in X$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? Give reason
-

B) If B is mean proportional between A, C .

Prove that: $\frac{a+b+c}{a^{-1}+b^{-1}+c^{-1}} = b^2$

Q4

A) If $\mathcal{F}(x) = 5x - b$, $\mathcal{G}(x) = x - 2b$, and $\mathcal{F}(1) + \mathcal{G}(3) = -7$,
Find $\mathcal{F}(3) + \mathcal{G}(1)$

B) If $Y = Z + 5$, $Z \propto \frac{1}{x}$, find the relation between X, y where $Y = 6$
when $X = 2$, then find Y when $X = 1$

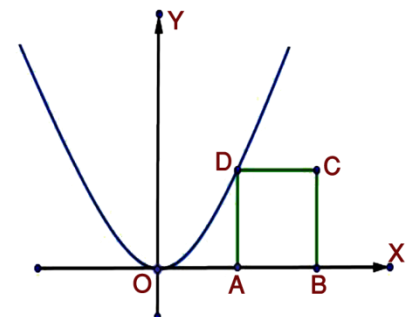
Q5

A) If $4a^2 + 9b^2 = 12ab$, prove that: a varies directly with b

B) In the opposite figure:

If $\mathcal{F}(x) = x^2$ and $ABCD$ is square

$B(6, 0)$, find the area of square $ABCD$



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No

13

Q1) A) Choose the correct answer:

(1) If the all the values are equals, then

- a) $X - \bar{X} > 0$ b) $X - \bar{X} < 0$ c) $\sigma = 0$ d) $\bar{X} = 0$

(2) If $\frac{y+3}{y} = \frac{x+2}{x}$, $x \neq y \neq 0$, then

- a) $Y \propto X$ b) $Y \propto \frac{1}{x}$ c) $Y \propto X + 2$ d) $Y \propto X + Y$

(3) If $(|x|, 4) = (3, Y^2)$, and the point (x, y) lies in the fourth quadrant, then $X + Y = \dots\dots\dots$

- a) 7 b) 1 c) -1 d) -7

B): Find the arithmetic mean and the standard deviation for the values 73, 54, 62, 71, 60

Q2) A) Choose the correct answer:

(1) The equation of line of symmetry $\mathcal{F}(x) = (X - 2)^2$ is

- a) $X = 0$ b) $X = 2$ c) $X = -2$ d) $X = -4$

(2) If $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = 2$, then $\frac{a}{d} = \dots\dots\dots$

- a) 5×2^2 b) 40 c) 10 d) 2×5^3

(3) If $F(x) = X^2$, $X \in [-2, 2]$, then $F(x) \in \dots\dots\dots$

- a) $[0, 4[$ b) $]0, 4[$ c) $[0, 4]$ d) $[-4, 4[$

B): If $\frac{y}{x-z} = \frac{x}{y} = \frac{x+y}{z}$, prove that each ratio equal 2 ($x + y \neq 0$)

Then find $X : Y : Z : \frac{2x + y - z}{7} = \frac{y+z}{9}$

Q3

A) If $X = \{1, 2, 3, 6, 11\}$ and \mathcal{R} is relation on X where $a \mathcal{R} b$ means " $a + 2b = \text{odd number}$ " for $a, b \in X$:

- ① Write \mathcal{R} and represents it by arrow diagram
 - ② Is \mathcal{R} function or not? Give reason.
-

B) If the Positive quantities $3K, 2L, M, 6N$ are in continued proportion, prove that: $\frac{L^3 + K^2}{27N + 4} = \left(\frac{2L^2}{3m}\right)^2$

Q4

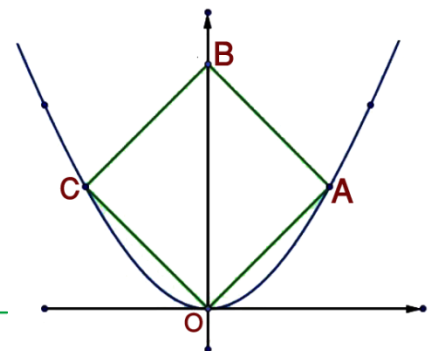
A) IF $\mathcal{F}(x) = 2x + K$, $\mathcal{G}(x) = x^2 + K$, and $\mathcal{F}(2) + \mathcal{G}(-4) = 30$,
Find $\mathcal{F}(-2) + \mathcal{G}(2)$

B) IF $Y = a - 9$, $Y \propto \frac{1}{x^2}$, and $a = 18$ at $X = \frac{3}{2}$, find the relation between X, y then find Y when $X = 1$

Q5

A) If $\frac{21x - y}{7x - z} = \frac{y}{z}$, prove that $Y \propto Z$

B) In the opposite figure:
The curve represents $\mathcal{F}(x) = x^2$
OABC is a square
Find the coordinate of A, B, C



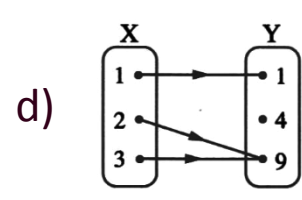
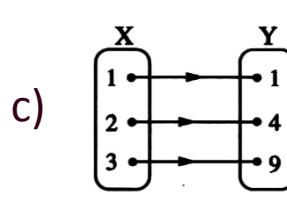
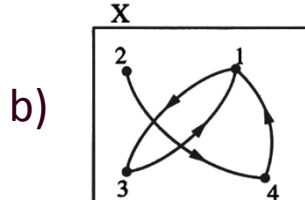
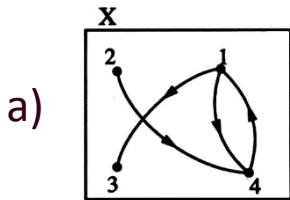
◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No

14

Q1 A) Choose the correct answer:

(1) Which of the following relations not a function?

(2) If $X = \{3\}$, then X^2

- a) $\{9\}$ b) 9 c) $\{(3, 3)\}$ d) $\{(3, 9)\}$

(3) If $\frac{a}{b} = \frac{2}{3}$, $\frac{a}{c} = \frac{4}{5}$, then $b : c =$

- a) 3 : 4 b) 5 : 6 c) 6 : 5 d) 4 : 3

B): Find the arithmetic mean and the standard deviation for the values 8, 9, 7, 6, 5

Q2 A) Choose the correct answer:(1) If $\mathcal{F}(x - 1) = X + 2$, then $\mathcal{F}(4) = \dots\dots\dots$

- a) 5 b) 6 c) 7 d) 8

(2) If $a, X, b, 2X$ are proportional quantities, the $\frac{a}{b} = \dots\dots$

- a) 2 b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) $\frac{1}{4}$

(3) The relation which represents direct variation between X, Y is ...

- a) $XY = 5$ b) $\frac{x}{5} = \frac{y}{3}$ c) $Y = X + 3$ d) $\frac{x}{5} = \frac{4}{y}$

B): If $\frac{x+y}{7} = \frac{y-2z}{5} = \frac{z+x}{4}$, **Find** the numerical value of $\frac{3x+2y}{x+3y-3z}$

Q3

A) If $X = \{-2, 2, 5\}$, $Y = \{3, 7, K\}$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $b = a^2 - 1$ " for $a \in X$, $b \in Y$:

- ① Find the value of K
- ② Represents \mathcal{F} by arrow diagram

B) If a, b, c, d are in continued proportion, prove that:

$$\Rightarrow \frac{a^2 + d^2}{c(a+c)} = \frac{b}{d} + \frac{d}{b} - 1$$

Q4

A) If the curve of $\mathcal{F}: \mathcal{R} \rightarrow \mathcal{R}$, $\mathcal{F}(x) = m - x^2$ cut X -axis at the point $(-2, b)$. **Find** the value $m^b + 2m$

B) IF $Y = a + 2$, $a \propto \frac{1}{x}$, and $a = 5$ at $X = 2$, find the relation between X, y then **find** Y when $X = 1$

Q5

A) If $2a = 3b = 4c$, **find** the numerical value of $\frac{a^2 + b^2 + c^2}{a(b+c)}$

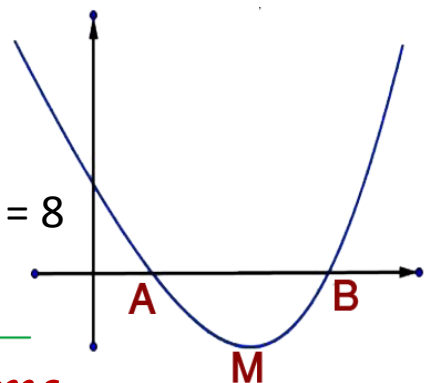
B) **In the opposite figure:**

The curve of quadratic function $F(x)$

Cuts X -axis in $A(1, 0)$, $B(4, 0)$

M is vertex of the curve and $F(-2) + F(7) = 8$

Find the value of $F(-2)$



◆ ◆ ◆
End of the questions

ALGEBRA – MODEL No**15****Q1) A) Choose the correct answer:**(1) If $(X - Y) \times Y = \{(1,2), (1,3)\}$, $n(X \times Y) = 6$, then $X = \dots\dots\dots$

- a) $\{1\}$ b) $\{1, 2\}$ c) $\{1, 3, 6\}$ d) $\{1, 3, 2\}$

(2) If $\mathcal{F}(x) = X - 5$, and $\frac{1}{2} \mathcal{F}(a) = 3$, then $a = \dots\dots\dots$

- a) 2 b) 8 c) 11 d) 16

(3) If $X \in \mathcal{R}^-$, then the point $(-X, \sqrt[3]{x})$ lies in the $\dots\dots\dots$ quadrant.

- a) First b) Second c) Third d) Fourth

B): If $4a^2 + 9b^2 = 12ab$, **prove that:** $a \propto b$ **Q2) A) Choose the correct answer:**(1) If $\mathcal{F}(x^2) = x + 2$, then $\mathcal{F}(9) = \dots\dots\dots$

- a) 5 b) 7 c) 11 d) 83

(2) If $\frac{a}{b} = \frac{2}{3}$, $\frac{a}{c} = \frac{4}{5}$, then $b : c = \dots\dots\dots$

- a) 3 : 4 b) 5 : 6 c) 6 : 5 d) 4 : 3

(3) The relation represents inverse variation between Y, X is $\dots\dots\dots$

- a) $Y = 4X$ b) $\frac{x}{y} = \frac{5}{7}$ c) $\frac{x}{5} = \frac{2}{y}$ d) $Y = X + 5$

B): If $\frac{x+y}{3} = \frac{y+z}{8} = \frac{z+x}{6}$,**Prove that:** $\frac{x+y+z}{2x+3y+3z} = \frac{17}{50}$

Q3

A) If $X = \{-3, -2, -1, 0, 1, 2, 3\}$, $Y = [0, 9[$ and \mathcal{R} is a relation from X to Y where $a \mathcal{R} b$ means " $a^2 = b$ " for $a \in X, b \in Y$:

- ① Write \mathcal{R} . ② Is \mathcal{R} is a function or not? Give reason.

B) If $\frac{21x+a}{7x+b} = \frac{a}{b}$, $X \neq 0$, find the value of $\frac{a+2b}{2a}$

Q4

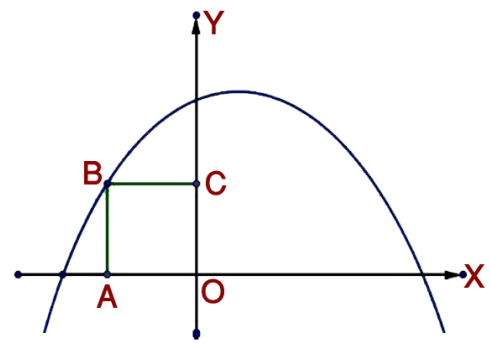
A) In the opposite figure:

The opposite figure represents

Curve of $\mathcal{F}(x) = -x^2 - x + 5$

If OABC is square,

Find its area?



B) IF $Y = K + m$, K is constant, $m \propto X$, and $Y = 3$ at $X = 0$, $Y = 5$ at $X = 3$ find the relation between X, y then **Find** Y when $X = 7$

Q5

A) If $\mathcal{F}(x) = Kx^2 + (3K + 2)x + 6$ and the X -coordinate of the vertex of $\mathcal{F}(x)$ equals 2, **Find** the value of K then find $\mathcal{F}(1) + \mathcal{F}(-1)$

B) The following table represents the excellent pupils in mathematics in 10 preparatory schools in Dakahlia:

No. of pupils	4	6	8	5	Sum
No. of schools	1	2	3	4	10

Find the arithmetic mean and standard deviation for the number of excellent pupils

◆ ◆ ◆
End of the questions

GEOMETRY – MODEL No**1****Q1****A) Choose the correct answer:**(1) $\tan 45^\circ = \dots\dots\dots$

a) $\sqrt{3}$

b) $\frac{1}{\sqrt{3}}$

c) 1

d) $\frac{1}{2}$

(2) The distance between $(5, 0)$, $(0, 12)$ equals Length unit

a) 5

b) 7

c) 13

d) 17

(3) The equation of straight line its slope equals 1 and passes through the origin point is

a) $X = -1$

b) $Y = -1$

c) $Y = -X$

d) $Y = X$

B): Without using calculator find the numerical value of:

$$\sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$$

Q2**A) Choose the correct answer:**(1) If $\sin X = \frac{1}{2}$, where X is an acute angle, then $\sin 2X = \dots\dots\dots$

a) 1

b) 2

c) $\frac{1}{2}$

d) $\frac{\sqrt{3}}{2}$

(2) The distance between $(3, -4)$ and X -axis = length unit

a) 3

b) 5

c) 4

d) -4

(3) If the two straight lines $X + Y = 5$, $KX + 2Y = 0$ are parallel, then the value of $K = \dots\dots\dots$

a) 2

b) -1

c) 1

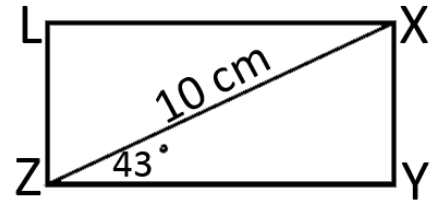
d) -2

B): Find the equation of the straight line passes through $(1, 2)$ and perpendicular on the straight line $X - 3Y + 7 = 0$

Q3

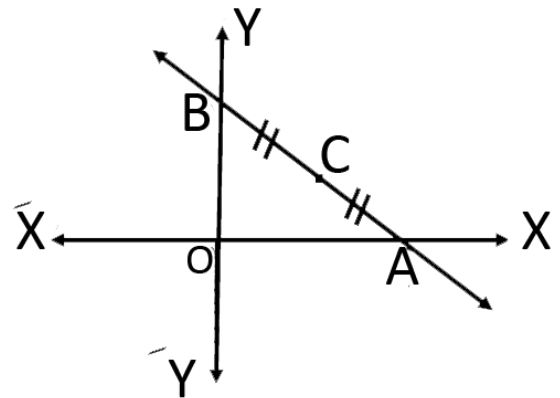
- A) Find the slope and the intercept part of Y-axis by the straight line $\frac{x}{2} + 3Y = 6$

- B) In the opposite figure:
 XYZL is a rectangle, $XZ = 10$ cm,
 $m(\angle XZY) = 43^\circ$.
 Find the perimeter of $\triangle XYZ$



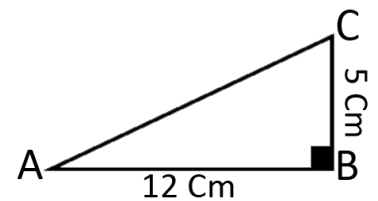
Q4

- A) In the opposite figure:
 C is midpoint of \overline{AB} , $C(4, 3)$,
 Find: ① The coordinate of A, B
 ② The equation of \overleftrightarrow{AB}



Q5

- A) Using the opposite figure,
 Find the value of $\sin A \cos B - \cos A \sin B$



- B) If $A(X, 3)$, $B(3, 2)$, $C(5, 1)$, and $AB = BC$,
 Find the value of X?

◆ ◆ ◆

End of the questions

GEOMETRY – MODEL No 2**2****Q1** A) Choose the correct answer:

- (1) The distance between $(0, 0)$, $(3, -4)$ equals Length units
a) 1 b) 5 c) -1 d) 7
- (2) The equation of the straight line which passes the point $(3, 5)$ and parallel to X – axis, is
a) $Y = 3$ b) $X = 3$ c) $X = 5$ d) $Y = 5$
- (3) In the isosceles right angle triangle, the tangent of its acute angle equals
a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) $\frac{\sqrt{2}}{2}$

B): Find the equation of the straight line passes through $(1, 2)$ and its slope $\frac{2}{3}$.

Q2 A) Choose the correct answer:

- (1) AB is a diameter in circle M, $A(-2, 3)$, $B(6, -5)$, then the coordinate of M =
a) $(4, 4)$ b) $(-2, 1)$ c) $(2, -1)$ d) $(-1, 2)$
- (2) In $\triangle DEF$ is right triangle at E, which of the following is false?
a) $\tan D \times \tan F = 1$ c) $\cos D = \sin F$
b) $\sin D = \cos F$ d) $\cos D = \sin E$
- (3) The straight line whose equation $3X + 4Y - 9 = 0$ is perpendicular on the straight line whose slope
a) $\frac{3}{4}$ b) $\frac{4}{3}$ c) $-\frac{3}{4}$ d) $-\frac{4}{3}$

B): Find the value of X, where X is an acute angle:

$$\cos(3X + 6)^\circ = \sin 30^\circ$$

Q3

- A) ABC is right angled – triangle at B, $AC = 5$ cm, $BC = 3$ cm
- ① Prove that: $\sin^2 A + \cos^2 A = 1$
 - ② Find the numerical value of $\sin C - \cos C + \tan C$
-
- B) ABCD is a quadrilateral, $A(0, 6)$, $B(-1, 3)$, $C(5, 1)$, $D(6, 4)$ by using the slope prove that ABCD is a rectangle.
-

Q4

- A) Find the slope of straight line \overleftrightarrow{AB} where $A(4, 3\sqrt{3})$, $B(5, 4\sqrt{3})$ then find the measure of the positive angle which \overleftrightarrow{AB} makes with positive direction of X – axis and find the length of intercept part from Y – axis
-
- B) Find to the nearest minute value of Y where $\cos Y = \frac{4}{3} - 2 \sin^2 45^\circ$ where Y is an acute angle.
-

Q5

- A) If the two straight lines $Y = 5 - X$, $KX + 2Y = 0$ are parallel, find the value of K
-
- B) If the axis of symmetry of \overleftrightarrow{CD} passes through $A(6, m)$ where $C(3, 1)$, $D(-3, 7)$, **find** the value of m
-

◆ ◆ ◆

End of the questions

GEOMETRY – MODEL No

3

Q1

A) Choose the correct answer:

(1) $\sin 45^\circ \cos 45^\circ = \dots\dots\dots$

- a) 2 b) 1 c) $\frac{1}{4}$ d) $\frac{1}{2}$

(2) In the $\triangle ABC$ right at B. $AB = \frac{1}{2} AC$, then $\cos A = \dots\dots\dots$

- a) $\frac{1}{2}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{1}{\sqrt{2}}$ d) $\frac{1}{\sqrt{3}}$

(3) The distance between $(3, -4)$ and X-axis = $\dots\dots\dots$ length unit

- a) -3 b) 4 c) -4 d) 3

B): In the $\triangle ABC$ right at B, $AC = 5$ cm , $BC = 4$ cmFind the numerical value of: $\sin C \cos A + \cos C \sin A$

Q2

A) Choose the correct answer:

(1) The straight line whose slope is additive invers is parallel to straight line whose equation is $\dots\dots\dots$

- a) $Y = X$ b) $Y = 1$ c) $X = 1$ d) $Y = -X$

(2) If the X-axis bisects \overleftrightarrow{AB} where $A(3, 2)$, $B(-2, Y)$, then $Y = \dots$

- a) 3 b) 2 c) -2 d) 4

(3) Two perpendicular straight lines, slope of the first $(-\frac{1}{4})$ and slope of the other $(4K)$, then $K = \dots\dots\dots$

- a) 4 b) 1 c) -4 d) $\frac{1}{4}$

B): If the distance between $A(X-1, 3)$, $B(5, 1)$ equals $\sqrt{13}$ length unit, find the value of X.

Q3

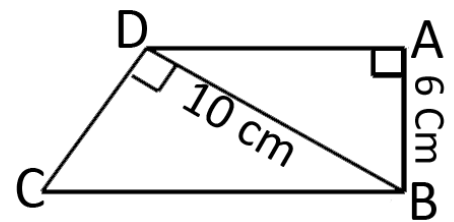
A) If $\sin X = 3 \sin 30^\circ \cos 60^\circ$, find the value of X to nearest minute, where X is an acute angle

B) The three points $A(3, Y)$, $B(X, 3)$, $C(5, 2)$ are collinear, if B is midpoint of \overline{AC} , find the value of $X + Y$

Q4

A) Find the equation of the straight line passes through $(3, -1)$ and perpendicular on the straight line $2X + Y = 5$

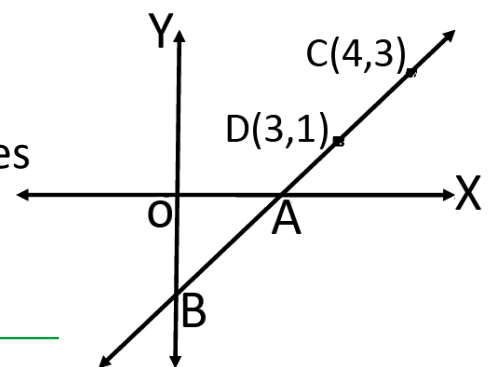
B) **In the opposite figure:**
 $ABCD$ is trapezium right at A ,
 $\overline{AD} \parallel \overline{BC}$, $AB = 6 \text{ cm}$, $BC = 10 \text{ cm}$
 Find $\tan(\angle ADB)$, **Find** the length of \overline{CD}



Q5

A) $ABCD$ is a quadrilateral, $A(5, 3)$, $B(6, -2)$, $C(1, -1)$, $D(0, 4)$ by using the slope **prove that** $ABCD$ is a parallelogram, then show that $ABCD$ is a Rhombus

B) In the opposite figure:
 The straight \overleftrightarrow{AB} passes through $C(4, 3)$, $D(3, 1)$ and cut the two axes
 At A , B , find the length of \overline{AO} , \overline{OB}
 Where O is origin point



End of the questions

GEOMETRY – MODEL No 4**4****Q1** A) Choose the correct answer:

(1) If $(2, -1)$ is midpoint of line segment whose terminals $(x, 2), (8, y)$, then $X + Y = \dots\dots\dots$

- a) Zero b) 4 c) -4 d) -8

(2) The St. line $Y = KX + 1$ is parallel to St. line $2Y - X = 5$, then $K = \dots$

- a) 1 b) 2 c) -2 d) $\frac{1}{2}$

(3) The equation of straight line passes $(-2, 7)$ and parallel to Y-axis is $\dots\dots\dots$

- a) $X + 2 = 0$ b) $X = 2$ c) $Y = 7$ d) $Y = -7$

B): Without using calculator find the numerical value of X:

$$\cos X = \frac{\sin 60 \sin 30}{\tan 45 \sin^2 45}, \text{ where } X \text{ is an acute angle}$$

Q2 A) Choose the correct answer:

(1) The distance between $(3, 0), (0, 4)$ equals $\dots\dots\dots$ Length units

- a) 3 b) 4 c) 5 d) 2

(2) If $2 \sin X - 1 = 0$, where X is an acute angle, $m(\angle X) = \dots\dots$

- a) 60° b) 90° c) 45° d) 30°

(3) $\triangle ABC$, $m(\angle B) = 90^\circ$, $3 \tan C - 4 = 0$, then $25 \sin C \cos C = \dots\dots$

- a) 3 b) 4 c) 25 d) 12

B): $\triangle ABC$ is right at B, $2 AB = \sqrt{3} AC$, find:

- ① The trigonometric ratio of $\angle C$
② $m(\angle A)$

Q3

- A) Find the equation of the straight line passes through (1 , 2) and perpendicular on the lines $X + Y = 7$
-
- B) The straight line $aX + 3Y - 6 = 0$, passes the point (1 , 3), find the value of A, then find the length of the intercept part from Y-axis
-

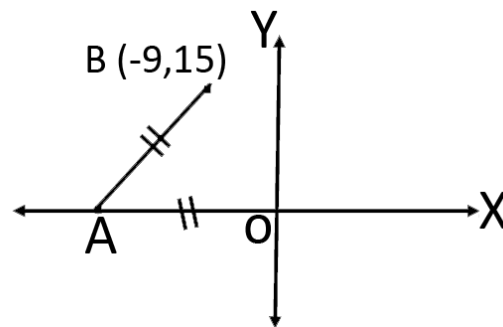
Q4

- A) ABCD is a trapezium in which $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 3$ cm, $AD = 6$ cm, $BC = 10$ cm.

Prove that: $\cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$

- B) **In the opposite figure:**

$A \in X\text{-axis}$, $AO = OB$,
Where O is origin point
Find the length of \overline{AB}
Where $B(-9, 15)$



Q5

- A) If the triangle XYZ is right at Y, $X(3, 5)$, $Y(4, 2)$, $Z(-5, a)$

- ① Find the value of a?
 - ② The area of $\triangle XYZ$
-

- B) IF $C(6, -4)$ is midpoint of \overline{AB} , $A(5, -3)$. **Find** the coordinate the point B
-

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End of the questions

GEOMETRY – MODEL No

5

Q1 A) Choose the correct answer:

(1) In the $\triangle ABC$, $m(\angle A) = 85^\circ$, $\sin B = \cos B$, then $m(\angle C) = \dots$

- a) 30° b) 45° c) 50° d) 60°

(2) The area of triangle bounded by lines $X = 0$, $Y = 0$, $3X + 2Y = 12$ equals Square units

- a) 6 b) 12 c) 4 d) 5

(3) If the straight line passes through $(1, y)$, $(3, 4)$ and its slope equals $\tan 45^\circ$, then $Y = \dots$

- a) 1 b) 2 c) -1 d) 4

B): ABCD is a trapezium in which $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 5\text{cm}$, $AD = 4\text{ cm}$, $BC = 12\text{ cm}$.

Find the value of expression: $\frac{\tan B \cos C}{\sin^2 C + \cos^2 B}$

Q2 A) Choose the correct answer:

(1) The straight line $aX + (2 - a)Y = 5$ parallel to straight line passes through two points $(1, 4)$, $(3, 5)$, then $a = \dots$

- a) 3 b) -2 c) 6 d) 4

(2) In $\triangle ABC$, $2m(\angle C) = m(\angle A) + m(\angle B)$, then $m(\angle C) = \dots$

- a) 30° b) 60° c) 45° d) 90°

(3) The straight line $\frac{x}{2} - \frac{y}{3} = 6$, cut from X - axis a part of Units

- a) 3 b) 2 c) 6 d) 12

B): AB is diameter in circle M, $B(8, 11)$, $M(5, 7)$, Find:

① Circumference of the circle□

② The equation of perpendicular line on \overline{AB} at point A

Q3

A) **Prove that** the quadrilateral ABCD where $A(-1, 3)$, $B(5, 1)$, $C(7, 4)$, $D(1, 6)$ is a parallelogram

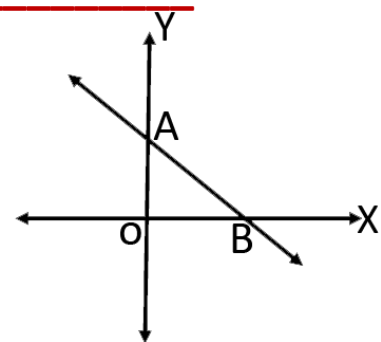
B) In the opposite figure:

The equation of \overleftrightarrow{AB} is $Y = KX + C$

And cut two axes in two equal parts

And passes through $(2, 3)$, Find:

- ① Value of K, C ② Area of $\triangle ABO$

**Q4**

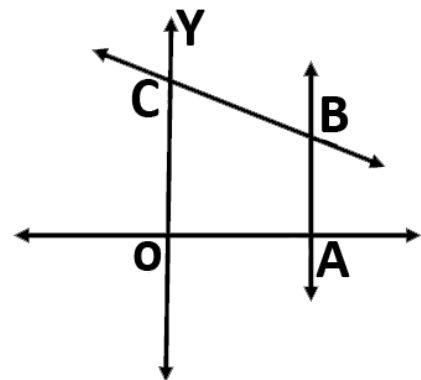
A) In the opposite figure:

\overleftrightarrow{AB} parallel to Y-axis,

The equation of \overleftrightarrow{BC} is $Y = -X + 3$

And passes through $B(2, 1)$, **find:**

- ① Length of BC ② Area of OABC
③ $m(\angle OCB)$



B) $\triangle ABC$ is right at B:

- ① **Prove that:** $\sin^2 A + \cos^2 A = 1$
② If $AB = 5$ cm, $AC = 13$ cm, **find** $m(\angle C)$ to nearest minute

Q5

A) Find the equation of straight line passes $(3, 4)$ and make with positive direction of X – axis an angle of 135°

B) Without using calculator, **prove that:**

$$\tan^2 60^\circ - \tan^2 45^\circ = \sin^2 60^\circ + \cos^2 60^\circ + 2 \sin 30^\circ$$

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End of the questions

GEOMETRY – MODEL No

6

Q1 A) Choose the correct answer:

(1) If $m(\angle A) = 75^\circ$, $\sin B = \cos B$, where B is acute angle, then $m(\angle B) = \dots\dots\dots^\circ$

- a) 45 b) 75 c) 15 d) 105

(2) If $\triangle ABC$ is an isosceles triangle and right at C, then $\tan A = \dots\dots\dots$

- a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) -1

(3) If $\overrightarrow{AB} \perp \overrightarrow{CD}$, Slope of $\overrightarrow{AB} = \text{zero}$, then slope of $\overrightarrow{CD} = \dots\dots\dots$

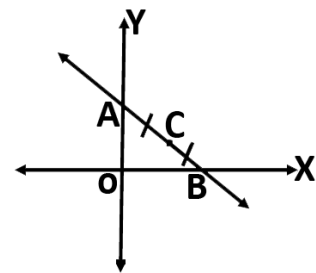
- a) 1 b) -1 c) Zero d) undefined

B): In the opposite figure:

C is midpoint of \overline{AB} , $C(4, 3)$

① Find the coordinate of A, B

② Find the area of $\triangle AOB$



Q2 A) Choose the correct answer:

(1) If $\cos 3X = \frac{1}{2}$, where $3X$ is acute angle, then $X = \dots\dots\dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(2) The radius of the circle whose its center $(0, 0)$ and passes through the point $(3, 4)$ equals $\dots\dots\dots$ length units

- a) 7 b) 1 c) 12 d) 5

(3) The measure of the exterior angle of an equilateral triangle = ...

- a) 60° b) 90° c) 120° d) 80°

B): Without using calculator **find** the value of X which satisfy:

$$2 \sin X = \tan^2 60^\circ - 2 \tan 45^\circ$$

Q3

A) Find the equation of straight line which cut from two axes two positive parts **2** units, **3** units

B) $\triangle ABC$ right at C, $AC = 5$ cm, $BC = 12$ cm, **Find** the numerical value of the expression: **$\cos A \cos B - \sin A \sin B$**

Q4

A) ABCD is a parallelogram, $A(3, 2)$, $B(4, -5)$, $C(0, -3)$, find :

- ① The coordinate of the intersection point of its diagonal
 - ② The coordinate of point D
-

B) Without using calculator **prove that:**

$$2 \sin 30^\circ + 4 \cos 60^\circ = \tan^2 60^\circ$$

Q5

A) **Prove that:**

$A(5, 1)$, $B(3, -7)$, $C(1, 3)$ are three non-collinear points

B) Find the equation of the straight line which is perpendicular to \overline{AB} at its midpoint where $A(2, 1)$, $B(4, 5)$

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End of the questions

GEOMETRY – MODEL No 7

Q1 A) Choose the correct answer:

- (1) If the ratio between two complementary angles 1 : 2, then the measure of greatest angle =^o
 a) 120 b) 90 c) 60 d) 30
- (2) The area of the circle whose center (3 , 4) and passes through origin points equals square units
 a) 49π b) 25π c) 10π d) 5π
- (3) ABCD is a Rhombus, A (- 3 , 2) , C (-1 , - 2) then the slope of \overrightarrow{BD} =
 a) - 2 b) $-\frac{1}{2}$ c) $\frac{1}{2}$ d) 2

B): If A (- 1 , 1) , B (3 , 1) , C (3 , 4) , **prove** that $\triangle ABC$ is right at B and find its Area

Q2 A) Choose the correct answer:

- (1) If $\sin (x + 5) = \frac{1}{2}$, where (X + 5) acute angle, X =
 a) 30° b) 25° c) 60° d) 55°
- (2) If m_1 , m_2 are two slopes of two parallel straight lines, then
 a) $m_1 - m_2 = 0$ b) $m_1 - m_2 = 1$ c) $m_1 \times m_2 = -1$ d) $m_1 + m_2 = 1$
- (3) The equation of the straight line which passes through (2 , 3) and perpendicular on Y-axis is
 a) X = 2 b) X = 3 c) Y = 2 d) Y = 3

B): IF the distance between (X , 5) and (6 , 1) equals $2\sqrt{5}$, **find** the value of X .

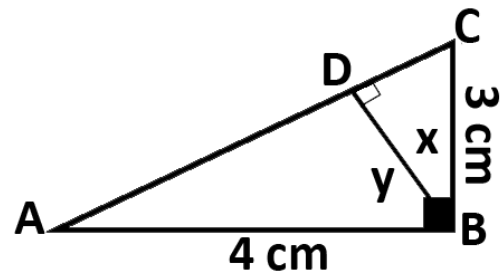
Q3

A) In the opposite figure:

$\triangle ABC$ right at B, $\overline{BD} \perp \overline{AC}$

AB = 3 cm, BC = 4 cm

Prove that: $\tan X + \tan Y = \frac{25}{12}$



B) Find the equation of the straight line which cut from the positive part of Y-axis 5 units and perpendicular on the straight line whose equation $2X - 5Y + 1 = 0$

Q4

A) If $\cos X = \tan 30^\circ \sin 60^\circ$, where X acute angle.

Without using calculator find the value of $\sin X \tan X$

B) $\triangle ABC$ where its vertices A (0 , 0) , B (3 , 0) , C (3 , 4) and D , E , F are midpoints of its sides \overline{AB} , \overline{BC} , \overline{AC} respectively. **Find** the perimeter of $\triangle DEF$

Q5

A) Find the slope and the intercept part of X-axis if the equation of the straight line $\frac{x}{2} + \frac{y}{3} = 1$

B) A ladder \overline{AB} is of length 6 meters, its upper edge A lies on a vertical wall and its other edge B on a horizontal floor. If C is the projection of point A on the surface for the floor and its angle of slope on the surface of the floor was measure of 60° , then find the length of \overline{AC} .

◆ ◆ ◆
End of the questions

GEOMETRY – MODEL No 8**8****Q1** A) Choose the correct answer:

(1) If $X \tan 60^\circ = 9$, then $X = \dots\dots\dots$

- a) $\sqrt{3}$ b) $2\sqrt{3}$ c) $3\sqrt{3}$ d) $9\sqrt{3}$

(2) The equation of straight line passes $(-2, 5)$ and perpendicular on X-axis is $\dots\dots\dots$

- a) $X = -2$ b) $X = 2$ c) $Y = 5$ d) $Y = -5$

(3) If $A(3, 4)$, then the area of square on $\overline{OA} = \dots\dots\dots$ square units where O is origin point

- a) 5 b) 25 c) 7 d) 49

B): **Prove that** the points $A(3, -1)$, $B(-4, 6)$, $C(2, -2)$ are lie on the same circle whose center $M(-1, 2)$, then find the area of the circle in the part of π .

Q2 A) Choose the correct answer:

(1) The straight line which passes through origin point and $(-1, -1)$ make a positive angle with positive direction of X-axis of measure $\dots\dots\dots^\circ$

- a) 30 b) 45 c) 60 d) 135

(2) If the ratio between two supplementary angles $2 : 3$, then the measure of smallest angle = $\dots\dots\dots^\circ$

- a) 18 b) 36 c) 72 d) 108

(3) The point lies on the straight line which passes $(3, 2)$, $(4, 4)$

- a) $(1, 1)$ b) $(2, 4)$ c) $(5, 6)$ d) $(6, 3)$

B): If $A(x, 3)$, $B(3, 2)$, $C(5, 1)$ and A lies on the axis of symmetry of \overline{BC} , find the value of X

Q3

- A) If $\cos 2X = \tan 45 \sin 30$, where $2X$ is acute angle, without using calculator find the value of: $\sin^2 X + \cos^2 X - 1$
-
- B) Prove that the point $A(5, 3)$, $B(3, -2)$, $C(-2, -4)$ are vertices of an obtuse - angled triangle at B , then find the coordinate of point D which make the figure $ABCD$ is Rhombus and find its area.

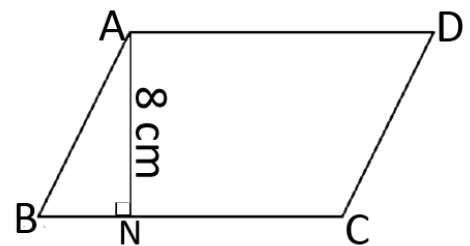
Q4

A) In the opposite figure:

ABCD is a parallelogram

Whose area 96 cm^2 , $\overrightarrow{AN} \perp \overrightarrow{BC}$,If $\tan B = 2$, $\frac{BN}{NC} = \frac{1}{3}$, find:

- ① Length of \overrightarrow{BC} , \overrightarrow{AB} ② $m(\angle D)$

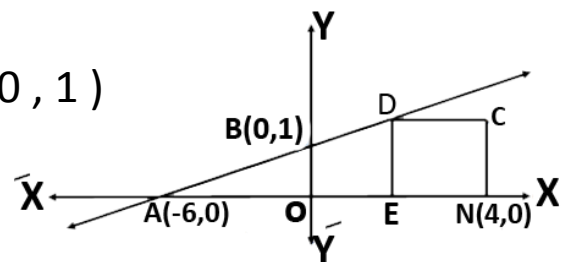


- B) Find the equation of the straight line which passes through $(3, -5)$ and parallel to the straight line $X + 2Y - 7 = 0$

Q5

A) The wind broke the upper point of a tree to make 60° angle with the ground level, if the top of the tree meets the ground 4 meters away from the button of the tree. Find the height of the tree to the nearest meter

- B) In the opposite figure:
 AB passes through $A(-6, 0)$, $B(0, 1)$
 DENC is a square, $N(4, 0)$
 Find the area of the square DENC



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End of the questions

GEOMETRY – MODEL No 9

Q1 A) Choose the correct answer:

(1) The equation of the straight line passes (3 , 4) and parallel to Y-axis is

- a) $X = 3$ b) $X = 4$ c) $Y = 3$ d) $Y = 4$

(2) A circle its center origin point and its radius is 2 units, which of the following points belongs to the circle?

- a) (1 , 2) b) (-2 , 1) c) ($\sqrt{3}$, 1) d) ($\sqrt{2}$, 1)

(3) The ΔABC is acute angled-triangle, if $m(\angle X) = 60^\circ$, $\sin Y = \cos Y$ then $m(\angle Z) = \dots\dots\dots^\circ$

- a) 70 b) 75 c) 80 d) 85

B): ΔABC , A (2 , 1) , B (2 , 5) , C (3 , 4) , D is midpoint of \overline{AB} , draw $\overline{DE} \parallel \overline{BC}$ and cut \overline{AC} at E. **find** the equation of \overline{DE}

Q2 A) Choose the correct answer:

(1) If m_1 , m_2 are two slopes of two parallel straight lines, then

- a) $m_1 = m_2$ b) $m_1 = -m_2$ c) $m_1 + m_2 = 0$ d) $m_1 = \frac{-1}{m_2}$

(2) If $\sin X = 2 \sin 30 \cos 60$, then $X = \dots\dots\dots^\circ$

- a) 30 b) 45 c) 60 d) 75

(3) If the distance between two points (a , 0) , (0 , 1) is $\sqrt{2}$, units then a =

- a) -3 b) 1 c) 2 d) 3

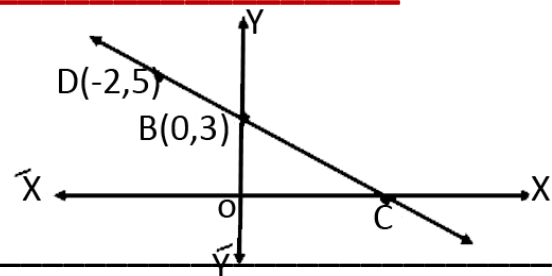
B): ABCD is a trapezium in which $\overline{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$, $AB = 3$ cm, $AD = 6$ cm, $BC = 10$ cm.

Prove that: $\cos(\angle DCB) - \tan(\angle ACB) = \frac{1}{2}$

Q3

A) If the points $A(-1, 3)$, $B(5, 1)$, $C(X, 4)$ are vertices of a right angled – triangle. Find the value X

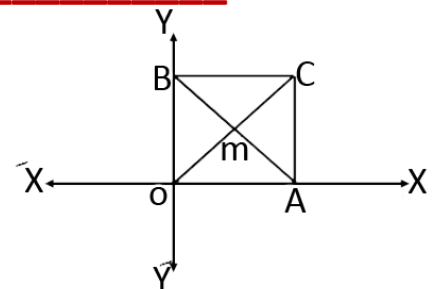
B) In the opposite figure:
If $B(0, 3)$, $D(-2, 5)$.
Find the area of $\triangle BCO$



Q4

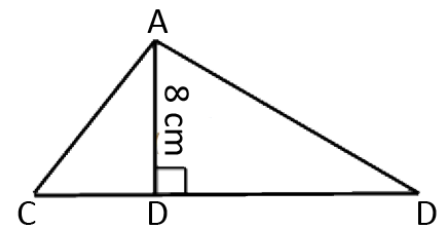
A) If X is an acute angle, $\cos X \tan X = \frac{1}{2}$, find the value of X ?

B) **In the opposite figure:**
 $AOBC$ is a square,
 M is intersection point of its diagonal,
 $M(2, 2)$, **find** the equation of \overleftrightarrow{AB}



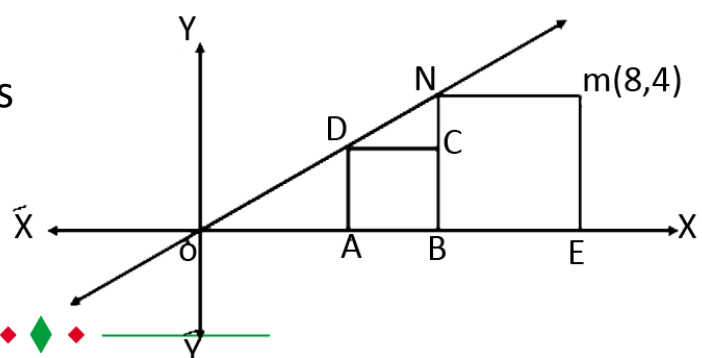
Q5

A) **In the opposite figure:**
 $\overline{AD} \perp \overline{BC}$, $AD = 8$ cm
If $\frac{1}{\tan B} + \frac{1}{\tan C} = \frac{3}{2}$, Find the length of \overline{BC}



B) **In the opposite figure:**
 $ABCD$, $EBNM$ are two squares
 $M(8, 4)$

- ① Find the equation of ND
- ② The coordinate of point D



End of the questions

GEOMETRY – MODEL NO

10

Q1) A) Choose the correct answer:

(1) If C is midpoint of \overline{AB} where $A(-4, -1)$, $C(2, 1)$, then $B = \dots$

- a) $(16, 0)$ b) $(8, 3)$ c) $(-2, 0)$ d) $(1, 2)$

(2) The area of triangle bounded by lines $X = 0$, $Y = 0$, $3X + 2Y = 6$ equals square units

- a) 2 b) 3 c) 6 d) 8

(3) If $\sin(X + 5) = \frac{1}{2}$, $(x + 5)$ acute angle, then $\tan(x + 20)^\circ = \dots$

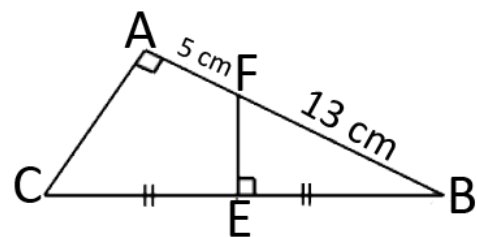
- a) $\frac{\sqrt{2}}{2}$ b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) 1

B): In the opposite figure:

E is midpoint of \overline{BC} , $\overline{FE} \perp \overline{BC}$

$\overline{AB} \perp \overline{AC}$, $OB = 13$ cm, $AO = 5$ cm.

Find $\tan B$?



Q2) A) Choose the correct answer:

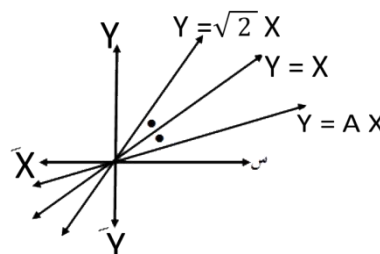
(1) The points $(0, 0)$, $(0, 8)$, $(6, 0)$ represents the sides of triangle

- a) Acute b) Isosceles c) Obtuse d) Right

(2) In the opposite figure:

$a = \dots$

- a) $\frac{1}{\sqrt{3}}$ b) $\frac{1}{\sqrt{2}}$
c) $\sqrt{2}$ d) $\sqrt{3}$



(3) If the two straight lines $3Y + X - 7 = 0$, $Y = KX + 5$ are perpendicular, then $K = \dots$

- a) -3 b) 3 c) $\frac{1}{3}$ d) $-\frac{1}{3}$

B): Find the equation of straight line which passes through $(1, 2)$ and perpendicular on straight line whose equation $2Y - 3X + 1 = 0$

Q3 A) On the orthogonal plane locate the points $A(0,5)$, $B(2,0)$, $C(0,3)$, $D(-2,0)$ then **find**:

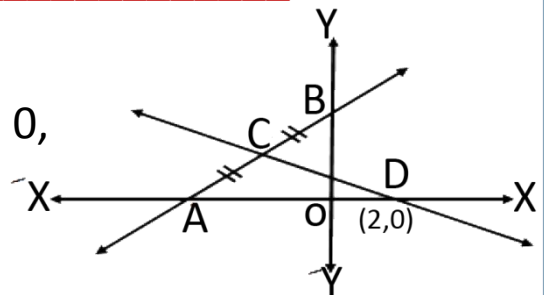
- ① The equation of St. Line passes through point **C** and parallel to \overleftrightarrow{BD}
- ② The area of the figure ABCD

B) **By using the opposite figure:**

If the equation of \overleftrightarrow{AB} is $2X - 3Y + 12 = 0$,

$D(2,0)$, C is midpoint of \overleftrightarrow{AB} ,

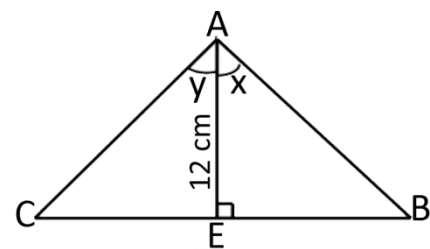
Find the equation of \overleftrightarrow{CD}



Q4 A) By using the slope, prove that the points $A(1,1)$, $B(4,-2)$, $C(6,0)$, $D(3,3)$ are the vertices of a Rectangle, then find its area

B) In $\triangle ABC$ right at B , **prove that:** $\sin A + \sin C > 1$

Q5 A) **In the opposite figure:**
 $\overline{AD} \perp \overline{BC}$, $\tan X + \tan Y = \frac{5}{4}$,
 Find the length of \overline{BC}

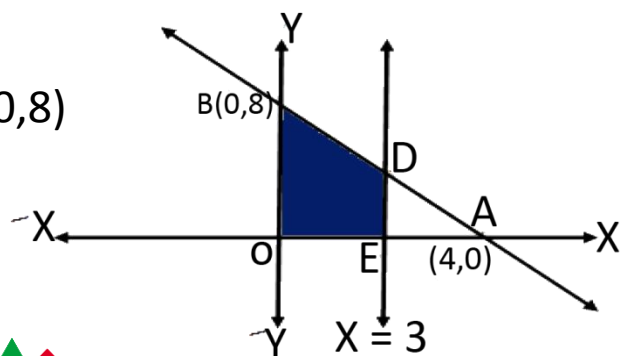


B) **In the opposite figure:**

AB passes through $A(4,0)$, $B(0,8)$

Equation of \overleftrightarrow{DE} is $X = 3$, find:

- ① The coordinate of D
- ② The area of figure DEOB



◆ ◆ ◆
End of the questions

GEOMETRY – MODEL NO

11

Q1) A) Choose the correct answer:

(1) The distance between $(4, -3)$ and X – axis = length unit

- a) -3 b) 1 c) 3 d) 4

(2) $\tan \theta \times \cos \theta = \dots\dots\dots$

- a) $\cos \theta$ b) $\sin \theta$ c) $\frac{1}{\cos \theta}$ d) $\frac{1}{\sin \theta}$

(3) The slope of straight line whose equation: $cX + aY + b = 0$ is

- a) $-\frac{a}{b}$ b) $-\frac{a}{c}$ c) $-\frac{b}{c}$ d) $-\frac{c}{a}$

B): Find the equation of straight line which passes through the point $(\sqrt{3}, -2)$ and make a 60° angle with positive direction of X-axis. **Then** find the length of intercept part of Y-axis

Q2) A) Choose the correct answer:

(1) ABCD is square, $A(3,5)$, $B(4,2)$, the slope of $\overrightarrow{BC} = \dots\dots\dots$

- a) -3 b) 3 c) 4 d) 5

(2) In $\triangle ABC$, $m(\angle A) : m(\angle B) : m(\angle C) = 3 : 4 : 5$, then $\cos B = \dots\dots\dots$

- a) Zero b) 1 c) $\frac{1}{2}$ d) $\frac{\sqrt{3}}{2}$

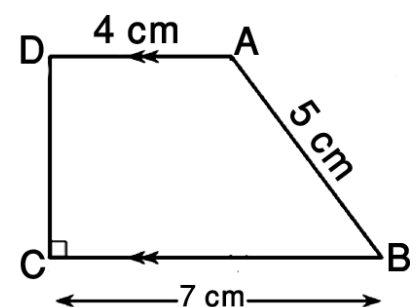
(3) The straight line whose equation $Y = X$ passes through

- a) $(-1, 0)$ b) $(0, 0)$ c) $(1, 0)$ d) $(0, -1)$

B): In the opposite figure:

ABCD is right trapezium at B, $\overline{AD} \parallel \overline{BC}$,
 $AB = 5 \text{ cm}$, $BC = 7 \text{ cm}$, $AD = 4 \text{ cm}$, **find:**

- ① $\sin B$, then **find** $m(\angle B)$
 ② The area of trapezium **ABCD**



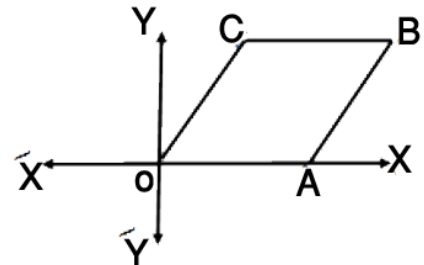
Q3

A) Without using calculator prove that:

$$3 \cos^2 30^\circ - \sin^2 45^\circ = \frac{7}{4} \tan 45^\circ$$

B) In the opposite figure:

OABC is a parallelogram, A(6,0), B(2,4)

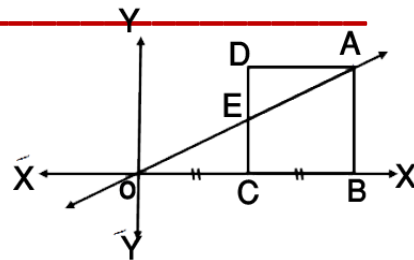
Find: ① Length of \overline{OB} ② Equation of \overrightarrow{OB} 

Q4

A) If the distance between two points (a, 7), (-2, 3) equals 5 units, find the value of a?

B) In the opposite figure:

ABCD is square, BC = CO

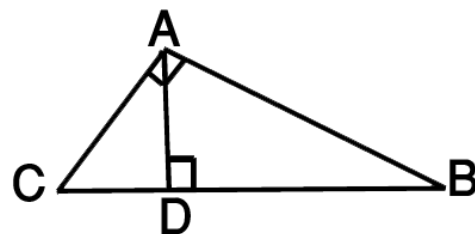
Find the equation of \overrightarrow{AO} 

Q5

A) If the points A(3, X), B(4, 1), C(5, 3) are collinear, find the value of X.

B) **In the opposite figure:** $\triangle ABC$ right at A, $\overline{AD} \perp \overline{BC}$

$$\frac{1}{\tan B} + \frac{1}{\tan C} = \frac{3}{2},$$

Find the length of \overline{BC} .

◆ ◆ ◆

End of the questions

GEOMETRY – MODEL NO

12

Q1) A) Choose the correct answer:

(1) If the two lines whose slopes $\frac{-2}{3}$, $\frac{k}{2}$ are parallel, then $K = \dots\dots$

- a) $-\frac{3}{4}$ b) c) 3 d) $-\frac{4}{3}$

(2) If $\sin(x + 5) = \frac{1}{2}$ where $(x+5)$ acute angle, then $X = \dots\dots\dots^\circ$

- a) 5 b) 10 c) 25 d) 30

(3) The area of triangle bounded by lines $3X - 4Y = 12$, $X = 0$, $Y = 0$ equals $\dots\dots\dots$ Square units

- a) 6 b) 7 c) 12 d) 15

B): Find the equation of axis of symmetry of \overline{AB} where $A(-2,3)$, $B(2,4)$

Q2) A) Choose the correct answer:

(1) ABCD is rhombus, $A(3,3)$, $C(-3,-3)$, then slope of $\overleftrightarrow{BD} = \dots\dots\dots$

- a) -1 b) 1 c) $\frac{1}{3}$ d) $-\frac{1}{3}$

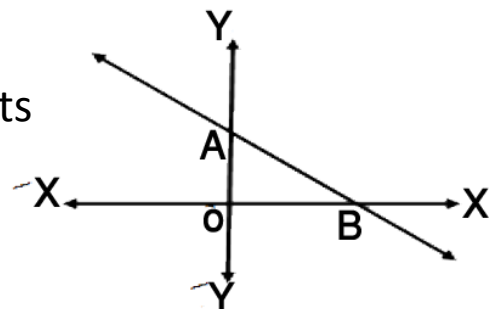
(2) $\tan 75^\circ = \dots\dots\dots$

- a) $\frac{\sin 75}{\cos 75}$ b) $\frac{\cos 75}{\sin 75}$ c) $3 \tan 25^\circ$ d) $3 \sin 25 \cos 25$

(3) The equation of straight line passes through $(5, 3)$ and parallel to x-axis is $\dots\dots\dots$

- a) $X = 0$ b) $X = 5$ c) $Y = 0$ d) $Y = 3$

B): In the opposite figure:

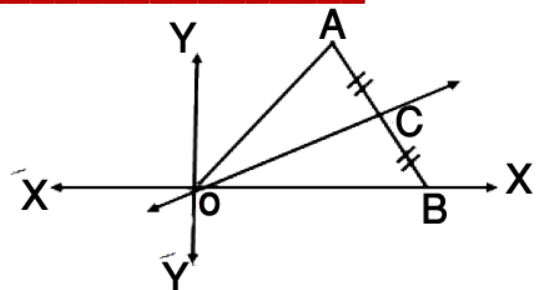
 $A(0, 6)$, area of $\triangle OAB = 9$ square unitsFind the equation of \overleftrightarrow{AB} 

Q3

A) Find the value of X which satisfies that:

$$4X = \cos^2 30^\circ \tan^2 30^\circ \tan^2 45^\circ$$

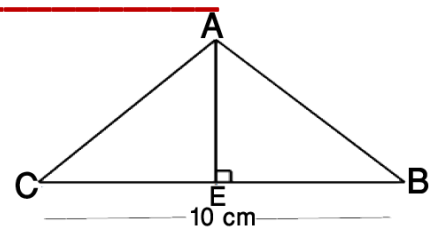
B) In the opposite figure:

 $\triangle BAO$ is an equilateralC is midpoint of \overline{AB} ,Find equation of \overrightarrow{OC} 

Q4

A) **Prove that:** $\triangle ABC$ where A (1,1) , B(3,1) , C(1,3) is an isosceles triangle then find its area.

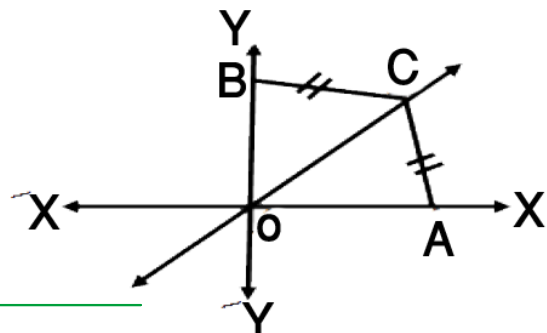
B) In the opposite figure:

 $\overline{AE} \perp \overline{BC}$, BC = 10 cmFind the value of: **$AB \cos B + AC \cos C$** 

Q5

A) In $\triangle ABC$ right at B, $\sin A + \cos C = 1$, Find the m ($\angle A$)B) In the opposite figure:

AO = 4 units, BO = 6 units

Equation of \overrightarrow{OC} is $Y = X$, $AC = BC$ Find the length of \overline{OC} .

◆ ◆ ◆

End of the questions

GEOMETRY – MODEL NO

13

Q1 A) Choose the correct answer:

(1) If the two lines $X + Y = 5$, $KX + 2Y = 0$ are parallel, then $K = \dots\dots$

- a) -2 b) -1 c) 1 d) 2

(2) If $\sin (X + 10) = \frac{1}{2}$, where $(x+10)$ acute angle, then $\cos 3X = \dots$

- a) 1 b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $\frac{1}{\sqrt{2}}$

(3) In $\triangle DEF$ right at E, which of the following false?

- a) $\tan D \times \tan F = 1$ c) $\cos D = \sin F$
 b) $\sin D = \cos F$ d) $\cos D = \sin E$

B): Find the equation of straight line whose slope $\frac{2}{3}$ and passes through the point $(3, -1)$

Q2 A) Choose the correct answer:

(1) AB is diameter in circle M, $A(-2, 3)$, $B(6, -5)$, then the coordinate of M =

- a) $(4, 4)$ b) $(-2, 1)$ c) $(2, -1)$ d) $(-1, 2)$

(2) The straight line whose equation $3X + 4Y - 9 = 0$ is perpendicular to straight line whose slope

- a) $\frac{3}{4}$ b) $\frac{4}{3}$ c) $-\frac{4}{3}$ d) $-\frac{3}{4}$

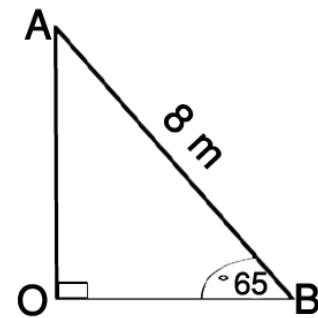
(3) $\triangle DEF$ right at F, and $\tan D = 1$, then

- a) $DE = DF$ b) $m(\angle E) = m(\angle F)$ c) $DF = EF$ d) $m(\angle D) = m(\angle F)$

B): If the axis of symmetry of CD passes through $A(6, m)$ where $C(3, 1)$, $D(-3, 7)$, **find** the value of m

Q3 A) In the opposite figure:

\overline{AB} is a ladder of length **8** meters, inclined on a horizontal floor with angle 65° and its upper edge **A** lies on a vertical wall \overline{OA} and its other edge **B** on a horizontal floor \overline{OB} . Find the length of \overline{OB} .

**B) In the opposite figure:**

OADB is a parallelogram

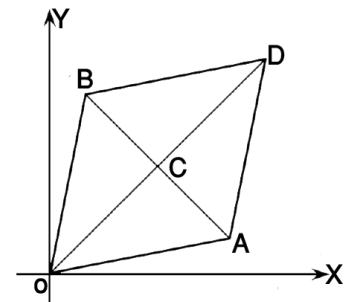
Its diagonal intersect at C,

O is origin point, A (5 , 1) , B (1 , 5)

① Find coordinate of C , D

② Find the m ($\angle DOE$)

③ Prove that OADB is rhombus

**Q4 A) If Y is acute angle, $\sin Y \sin^2 45 = \frac{\tan^2 45 - \cos^2 60}{\tan 60}$**

Find the value of Y

B) ABCD is a rectangle, A (1 , 1) , B (3 , 3) , C (0 , - 3 X) , D (X , Y)
Find the value of X , Y

**Q5 A) $\triangle ABC$ is right at B, $7 \tan A - 24 = 0$,
Find the value: $1 - \tan A \sin C$** **B) In the opposite figure:**

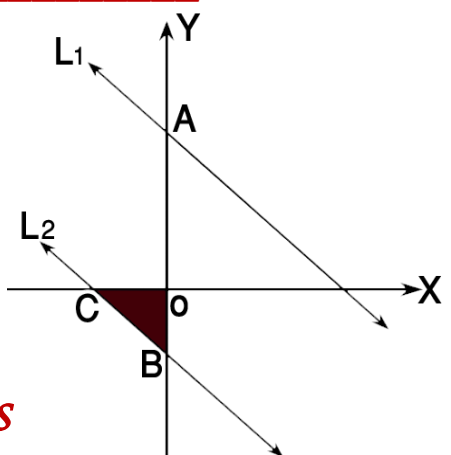
L_1, L_2 are two parallel lines,

$L_1 : Y = 5 - X$, $AB = 7$ units

L_2 cut two axes in B, C, find:

① Length of \overline{OA} , \overline{OC}

② Area of $\triangle OBC$



◆ ◆ ◆
End of the questions

GEOMETRY – MODEL No

14

Q1 A) Choose the correct answer:

(1) If the point (K , 2 K) lies on the St. line $2 X + Y = 8$, then $K = \dots$

- a) -2 b) 1 c) 2 d) 3

(2) If $\sin 2 X = \frac{\sqrt{3}}{2}$, where $2 X$ an acute angle, then $X = \dots\dots\dots^\circ$

- a) 20 b) 30 c) 45 d) 60

(3) The opposite figure:

Quarter circle of radius 7 cm

Its perimeter = $\dots\dots\dots$ cm

- a) 11 b) 14 c) 22 d) 25

B): If the point (5 , 2) is midpoint of \overline{AB} , $A (X , 7)$, $B (- 4 , Y)$
Find the value of $X + Y$

Q2 A) Choose the correct answer:

(1) ABCD is a rhombus, $m(\angle B) + m(\angle D) = 200^\circ$, then $m(\angle BAC) =$

- a) 40 b) 50 c) 80 d) 10

(2) The equation of straight line which passes through (-2 , K) and parallel to X-axis is $\dots\dots\dots$

- a) $X = - 2$ b) $Y = - 2$ c) $X = K$ d) $Y = K$

(3) The straight line whose equation $B X + C Y + A = 0$, its slope = \dots

- a) $-\frac{b}{c}$ b) $-\frac{c}{b}$ c) $-\frac{c}{a}$ d) $\frac{c}{b}$

B): $\triangle ABC$, $A (3 , 2)$, $B (4 , - 5)$, $C (0 , - 3)$
 \overline{AD} is median, **Find** the equation of \overleftrightarrow{AD}

Q3

A) Find the value of X which satisfies:

$$X \sin^2 45^\circ = \sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ$$

B) ABCD is a rectangle in which its length is twice its width, A(8 , 8) , C (- 2 , 3) . **Find** its perimeter?

Q4

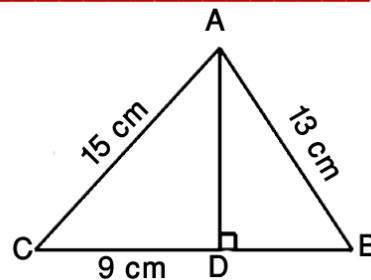
A) By using the slope, prove that the points A (-1 , -1) , B (2 , 3) , C (6 , 0) , D (3 , -4) are vertices of square.

B) In the opposite figure:

$\triangle ABC$, $AD \perp BC$, $AC = 15$ cm,

$AB = 13$ cm, $CD = 9$ cm

Find the value of: **$\tan B - \cos C$**



Q5

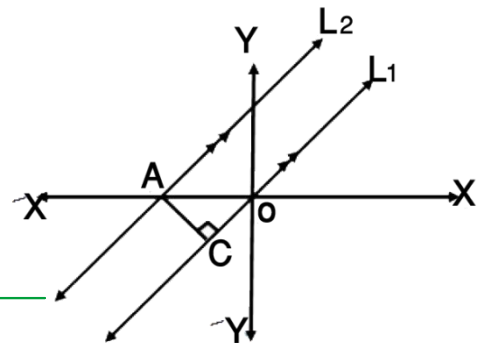
A) $\triangle ABC$ is right at B, $AC = 8$ cm, $m(\angle A) = 56^\circ$, **find** to the nearest cm the perimeter of $\triangle ABC$

B) In the opposite figure:

Equation of L_1 is $Y = X$, $L_1 \parallel L_2$

$AC = 3\sqrt{2}$ unit length

Find the equation of L_2



End of the questions

GEOMETRY – MODEL NO

15

Q1) A) Choose the correct answer:

(1) The distance between $(K, -4)$ and Y-axis is units, $K \in R$

- a) 4 b) K c) -4 d) $|K|$

(2) If $\sin X = 2 \cos 60^\circ \sin 30^\circ$, where X is acute angle, then $X = \dots^\circ$

- a) 30 b) 60 c) 45 d) 75

(3) The two lines $3X - 4Y - 3 = 0$, $4X + KY - 8 = 0$, are perpendicular, then $K = \dots\dots\dots$

- a) -4 b) -3 c) 3 d) 4

B): ABCD is a square, $A(5, 4)$, $C(-1, 6)$ Find the equation of \overleftrightarrow{BD}

Q2) A) Choose the correct answer:

(1) A circle, its center is an origin point, and its radius is 2 units, which of the following points belongs to the circle?

- a) $(1, 2)$ b) $(-2, 1)$ c) $(\sqrt{3}, 1)$ d) $(\sqrt{2}, 1)$

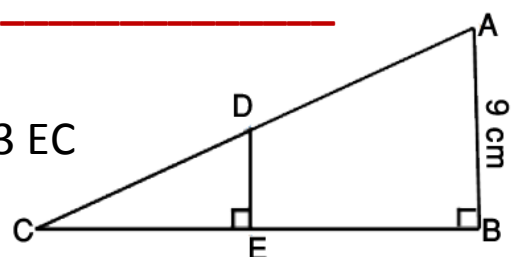
(2) $\triangle ABC$ right at B, $3AC = 5BC$, then $\tan A = \dots\dots\dots$

- a) $\frac{3}{5}$ b) $\frac{5}{3}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$

(3) The straight line $2X - 3Y - 6 = 0$ cut from Y-axis a part of length unit

- a) -6 b) -2 c) $\frac{2}{3}$ d) 2

B): In the opposite figure:

ABC is right at B, $AB = 9$ cm, $4DE = 3EC$ $\overline{DE} \perp \overline{BC}$, find the area of $\triangle ABC$ 

Q3

A) Find the value of X which satisfies:

$$\sin X \sin^2 60^\circ = 3 \sin^2 45^\circ \cos^2 45^\circ \cos 60^\circ$$

B) In $\triangle ABC$, $A(1, 1)$, $B(3, 1)$, $C(1, 3)$.

① Prove that $\triangle ABC$ is an isosceles triangle

② Find the equation of axis of symmetry of the triangle.

Q4

A) By using the slope, prove that the points $A(-1, 3)$, $B(5, 1)$, $C(6, 4)$, $D(0, 6)$ are vertices of a rectangle.

B) \overline{AB} is a diameter in the circle M, $M(5, 7)$, $B(8, 11)$, find the equation of the perpendicular straight line on AB at point A

Q5

A) If $A(X, 3)$, $B(3, 2)$, $C(5, 1)$, and $AB = BC$
Find the value of X

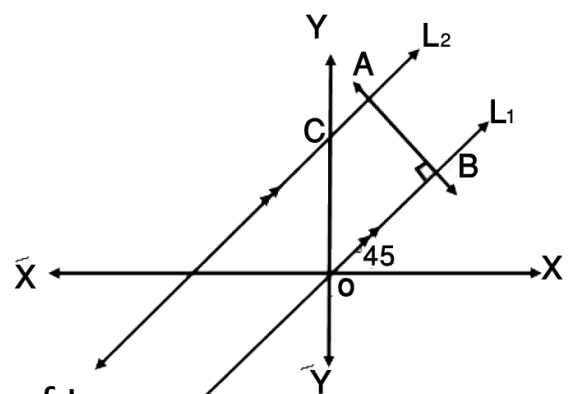
B) In the opposite figure:

$L_1 \parallel L_2$, L_1 makes with positive direction of X-axis angle of measure 45° and passes through origin point, $A \in L$, $A(1, 5)$, $\overline{AB} \perp L_1$, L_2 cut Y-axis at point C, find:

① Equation of L_1

② Equation of L_2

③ Length of \overline{AB}



◆ ◆ ◆
End of the questions

حمل الآن

مجاناً وحصرياً

امتحانات رقم (4)

الترم الاول



Q1 **A** choose the correct answer:-

① IF standard deviation for 3 values = 2, then $\Sigma (X - \bar{X})^2 = \dots$
 (a) 6 (b) 12 (c) 18 (d) 24

② IF $\frac{x}{y} = \frac{3}{4}$, $\frac{y}{z} = \frac{3}{2}$ then $\frac{x}{z} = \dots$

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{9}{8}$ (d) $\frac{8}{9}$

③ IF $(3x-3)(y^2+1) = 3$, then $y^2+1 \propto \dots$
 (a) $x-1$ (b) $x+1$ (c) $\frac{1}{x+1}$ (d) $\frac{1}{x-1}$

B IF $\frac{5L+m}{2L+3m} = 1$ prove that: $L \propto m$

Q2 ① sixth the number $2^x \times 3^x$ is \dots
 (a) 6^x (b) 6^{x-1} (c) 3^x (d) 2^x

② IF $a^3 = b\sqrt{b}$, then $a^2 = \dots$

(a) b (b) b^2 (c) \sqrt{b} (d) $\sqrt[3]{b}$

③ Function of x -axis represented graphically by cartesian product \dots

(a) $R \times \emptyset$ (b) $R \times \{0\}$ (c) $\{0\} \times R$ (d) $\emptyset \times R$

B IF $\frac{y}{x-z} = \frac{x}{y} = \frac{x+y}{z}$

Prove that: all of these ratio = 2

" IF $x+y=0$ " then find $y:z$

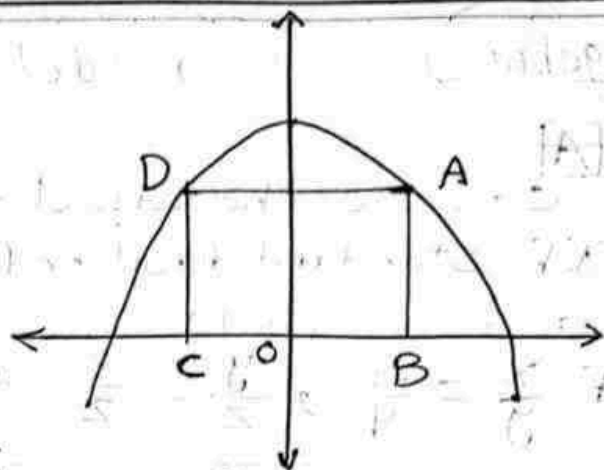
[Q3] (a)

In the opposite figure:-

If $f: f(x) = 8 - x^2$

where $BC = AB$

Find: Area of figure ABCD



(b) Two positive numbers
their ratio between them 2:3

and square the half of smaller exceeds by twice
of the greater by 16. Find the two numbers

[Q4] (A)

IF $2 = \frac{a}{b} = \frac{b}{c}$ find S.S of equation

$$ax^2 - 2bx + c = 0$$

(B) IF $X = \{-1, 0, 1\}$ and R is a relation on X where

aRb means " $b = a^2$ " For every $a \in X, b \in X$

write R , represent it by arrow diagram, Is R function

Mention its range?

[Q5] (A)

IF y varies inversely with x and $y = 4$ when
 $x = 3$ Find ① relation between y, x

②. Value of y when $x = 6$

(B) Find standard deviation for

22, 21, 20, 19, 18

Algebra

model 2

math inspection.

Q1. A) the positive middle proportional for 2, 18 is

- (a) 9 (b) 6 (c) -6 (d) 36

② IF the point $(3, y-2)$ lies on X-axis then $y = \dots$

- (a) -3 (b) -2 (c) 2 (d) zero

③ mariam bought a cleaner with 8600 pounds. IF the rate of discount was 12%, then mariam will pay to buy the cleaner pounds

- (a) 8600 (b) 1032 (c) 7568 (d) 9623

B) IF $4a^2 + 25b^2 = 20ab$

Find the value of : $\frac{4b^2 - ab}{(a+b)^2}$

Q2:- (A) choose:-

① the minimum value for function $f(x) = 4x + 2x^2 + 3$ is

- (a) -1 (b) 1 (c) 4 (d) 3

② IF $y \propto x$, $z \propto \frac{1}{y}$ then y varies with

- (a) xz (b) $\frac{x}{z}$ (c) $\frac{z}{x}$ (d) constant $\times \frac{z}{x}$

③ IF $\{3\} \times \{x, y\} = \{(3, 2), (3, 4)\}$ then $x - y = \dots$

- (a) 2 (b) -2 (c) ± 2 (d) zero

B) IF $X \subset Y$, $n(X \times Y) = 6$, $4 \in X$, $(1, 7) \in X \times Y$

Find : (1) X , Y (2) $X \times Y$

Q3 A) IF $X = \{2, 4, 5\}$, $Y = \{1, 4, 6, 7\}$, R is a relation from X to Y where " aRb " means " $a > b$ ".

For $a \in X$, $b \in Y$ write R , Arrow diagram, function.

B) Find mean and Standard deviation For:

8, 9, 7, 6, 5

Q4:-

[A] IF $f(x) = x^2 + K$, $g(x) = K - 2x$

$f(-4) + g(-2) = 16$ Find: $f(-2) + g(2)$

[B] IF $y = a + 5$, $a \propto \frac{1}{x^2}$, $A = 9$ when $x = \frac{2}{3}$, Find relation between x, y

then find Value of y when $x = 2$.

[Q5] [A] IF $\frac{x}{2b+c} = \frac{y}{3c-b} = \frac{z}{4b+5c}$

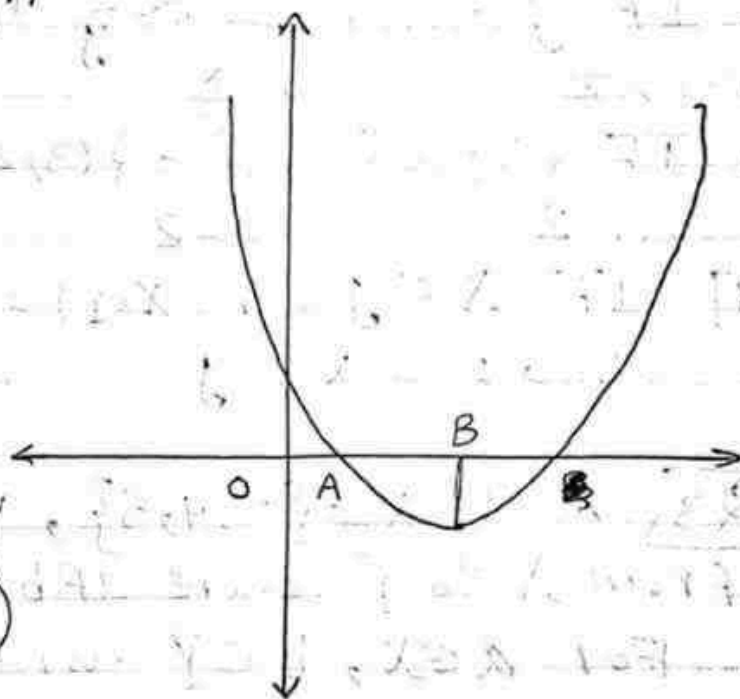
prove that: $\frac{x+2y}{4y+z} = \frac{7}{17}$

[B] in the opposite figure:-

$f(x) = x^2 - 12x + m + 2$

$AB = 2AO$

Find: Value of m



[Q1] (A) choose

- ① IF $2b$ is a middle proportional between a , $5c$ then $\frac{b^2}{ac} = \dots$
 (a) $\frac{5}{4}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) 10
- ② IF $(1x1, 9) = (2, x^2)$, (x, y) lies on second quadrant then $x + y = \dots$

(a) 5 (b) 1 (c) -1 (d) -5

- ③ IF $y - 4 = 2x$, then $y \propto \dots$

(1) x (b) $2x$ (c) $x + 2$ (d) $x + 4$

[B] IF $2a = 3b = c$ Find the value of

$$\frac{c^2 - a^2 - 2b^2}{a(c - b)}$$

[Q2] (A) choose

- ① IF $a, 6, b, 54$ four positive quantities in continued proportion then $ab = \dots$
 (a) 26 (b) 36 (c) 20 (d) 18
- ② IF $f(x-5) = x-2$, then $f(3) = \dots$
 (a) 5 (b) 1 (c) 6 (d) 3
- ③ IF $b > 2$, $(-2, b-2)$ lies on \dots quadrant.
 (a) first (b) second (c) third (d) fourth

[B] Find mean and standard deviation for:-

8, 9, 10, 11, 12

[Q3] (A) IF $X = \{1, 2, 3, 4, 5, 6\}$, R is Relation on X
 "aRb" means " $a+b=7$ ". $a \in X, b \in Y$
 write R , Arrow, function, range.

[B]
$$\frac{x+2y}{a+4b} = \frac{2y+5z}{4b+7c} = \frac{5z+x}{7c+a}$$

prove that $Ay = 2bx$

[Q4] (A) in the opposite figure:-

\overleftrightarrow{AC} represent graphically for linear function $f(x) = 4 - \frac{4}{3}x$
 \overleftrightarrow{AB} " " " " " $g(x) = kx + m$

$B(0, 5)$. Find value of: k and m

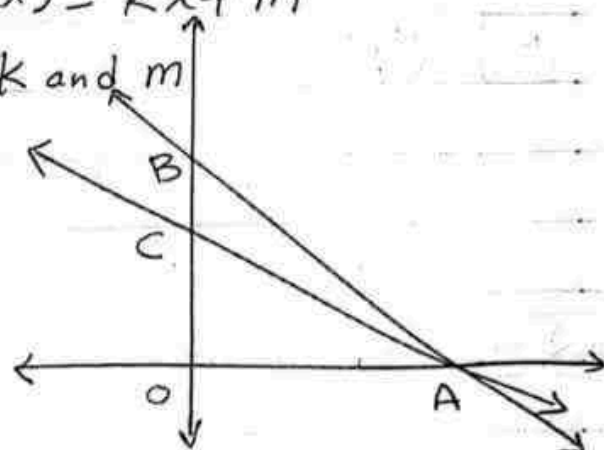
(B) $X - Y = \{5\}$, $Y - X = \{2, 3\}$,
 $X \cap Y = \{4\}$. Find

① $(X - Y) \times Y$ ② $n[(Y - X) \times X]$

[Q5] (A) Represent graphically

$f: f(x) = (x-2)^2 + 1, x \in [0, 4]$

Find: minimum value, equation of symmetry axis.



[B] $y = a + b$ (a is constant; $b \propto x$)

$b = 6$ when $x = 2$, $y = 5$ when $x = 1$

Find relation between x, y

Algebra

model 4

Math inspection

Q1:- (A) choose

- ① IF $3a = 5b$, $2a + b = 26$, then $a + b =$ ----
(a) 8 (b) 16 (c) 13 (d) 18
- ② IF $x \in [-1, 5]$, $y \in [-3, 3]$ then $(-2, 4) \in$ ----
(a) X (b) y^2 (c) $X \times Y$ (d) $Y \times X$
- ③ IF the price of an item decreases from 1500 to 1200 pounds, then rate of discount = ----
(a) 3% (b) 15% (c) 20% (d) 30%
- ④ IF $a, 2b, 3c, 4d$ in continued proportion
prove that $(2b - 3c)$ is middle between $(a - 2b)$, $(3c - 4d)$

Q2 (A) choose

- ① IF $(3 - x, x - 4)$ lies on fourth quadrant; then $x =$ ----
(a) 3 (b) 5 (c) 2 (d) 4
- ② IF the range for values: 7, 2, 9, K, 6 is 9 then $K =$ ----
(a) 15 (b) 6 (c) 16 (d) 11
- ③ IF $X = \{22\}$, then $n(X^2) =$ ----
(a) 4 (b) 1 (c) 22 (d) 44

[B] IF $X = \{-1, 1, 2, \frac{1}{2}\}$, R is a relation on X
 $a R b$ means $(a \text{ is multiplicative inverse of } b)$
 $a \in X, b \in X$, write R ---- and so on

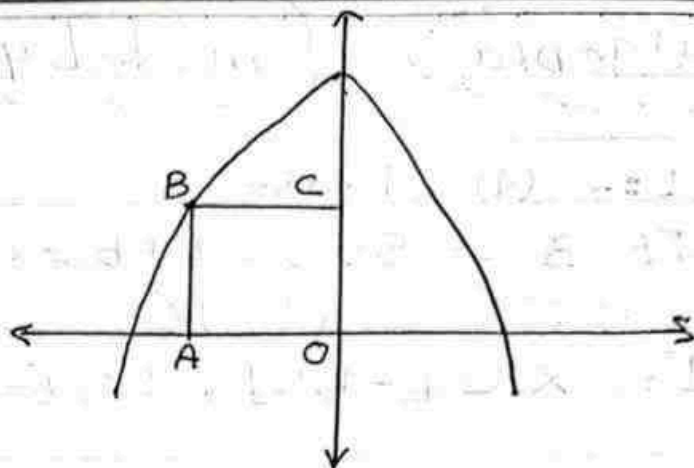
[Q3] (A) IF $y = 3 + a$, $a \propto \frac{1}{x}$, find relation
between x, y IF $a = 3$, when $x = 4$
then find y when $x = 6$

[B] in the opposite figure:-

$$P(x) = -x^2 + x + 15$$

OABC is Square

Find: Area of Square OABC.



[Q4] (A)

If the curve of function $f: \mathbb{R} \rightarrow \mathbb{R} : f(x) = K - x$

Cuts x-axis at point $(-3, b)$ Find:

Value of: $2K + K^b$

(B) Find mean and S.d for: 6, 8, 10, 12, 14

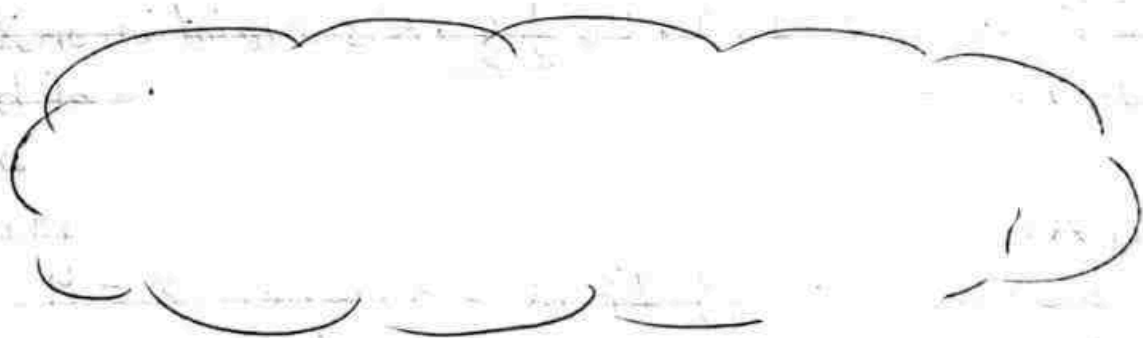
(b) [Q5] (A)

$$\text{If } \frac{5x+3y}{7a+5b} = \frac{3y+5z}{5b+7c} = \frac{5z+2x}{7c+5a}$$

prove that: All ratios = $\frac{7x}{12a}$

(B) If $n(X \times X) < 16$, $5 \in X$, $(1, 4) \in X^2$

Find $X \times X$.



Q1

(A) choose :-

① If $\frac{a}{12} = \frac{b}{5} = \frac{a-2b}{K}$, then $K = \dots$

(a) 1

(b) 2

(c) 3

(d) 4

② If $A \subset C$, $B \subset C$, $n(A) = 18 - n(B)$,
 $n(B) = 12 + n(A)$, then $n(B) = \dots$

(a) 12

(b) 14

(c) 15

(d) 18

③ If $f(x) = x^2(5x-3)^2$ from --- degree.

(a) first

(b) second

(c) third

(d) fourth

(B)

If $X = \{4, 5\}$, $Y = \{3, 4\}$, $Z = \{5, 6\}$, Find

(1) $Z \times (Y - X)$

(2) $(Z \cap X) \times Y$

Q2

(A) choose

① $10^2 - 9^2 + 8^2 - 7^2 + 6^2 - 5^2 + 4^2 - 3^2 + 2^2 - 1^2 = \dots$

(a) 52

(b) 53

(c) 54

(d) 55

② $2^x = 5$, then $2^{x+2} = \dots$

(a) 5

(b) 10

(c) 20

(d) 25

③ If real length is 5m, length in drawing 5cm
 then drawing Scale is ---

(a) 1:1

(b) 1:10

(c) 1:100

(d) 1:1000

(B) If B is middle proportional between a and c

Prove that: $\frac{2c^2 - 3b^2}{2b^2 - 3a^2} = \frac{c}{a}$

Q3 (A) IF $(y-x) \propto \left(\frac{1}{y} - \frac{1}{x}\right)$ prove that: $y \propto \frac{1}{x}$

(B) find S.d for 12, 13, 16, 15, 11

Q4 (A) IF $x = \{2, 3, 4, 5\}$, $y = \{1, 3, 5, 7, 9\}$

R is a relation on X "aRb" means $(b = 2a - 3)$
for $a, b \in X$, write R --- soon.

(b) $\frac{x}{3} = \frac{y}{5} = \frac{3y-x}{4K}$ find value of K .

Q5 (a) find the real number x that make
 $x+2, x+6, x+14$ are proportional.

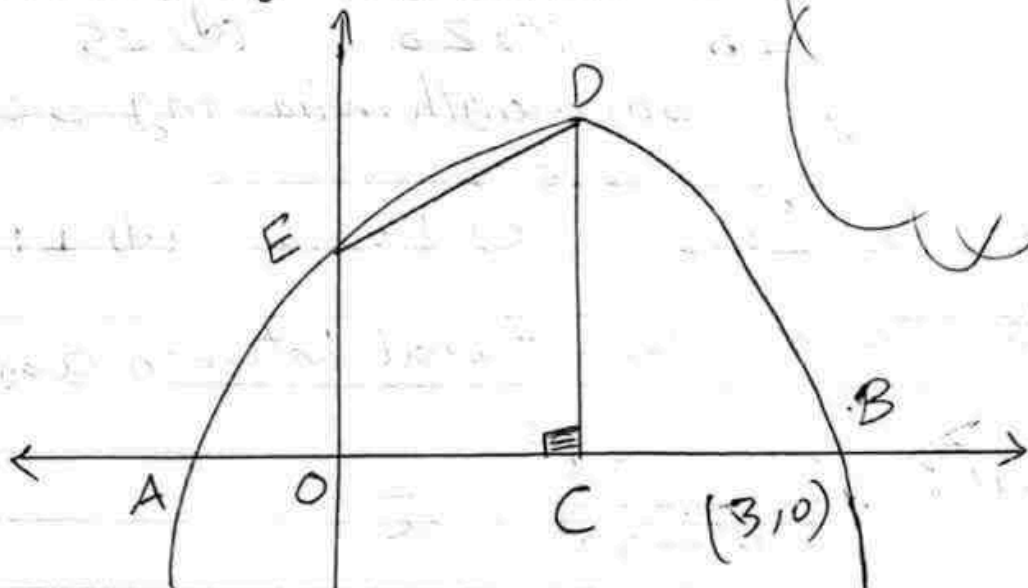
(B) the opposite figure:

represents curve of function f

$$f(x) = -x^2 + 2x + k + 1$$

d is vertex of curve

find: A.O.F figure O C d E.



Q1 (A) choose:

- ① the middle proportional between 2, 8 is ----
 (a) $\frac{1}{4}$ (b) 4 (c) -4 (d) ± 4
- ② $xy = 4$, then ----
 (a) $y \propto x$ (b) $y \propto \frac{1}{y}$ (c) $x \propto y + 4$ (d) otherwise
- ③ two numbers ratio between them 2:5, the smaller number is 48, then the greater number = ----
 (a) 96 (b) 120 (c) 240 (d) 60
- (b) If $X = \{4, 3\}$, $Y = \{4, 5\}$, $Z = \{5, 6\}$ Find:
 (1) $Z \times (X - Y)$ (2) $(Z \cap X) \times Y$

Q2 (A) choose

- ① range for values: 53, 58, a, 54, 55, 62 is 11
 then a = ----
 (a) 60 (b) 64 (c) 42 (d) 66
- ② If $2^x = 3$, then $2^{x+1} =$ ----
 (a) 3 (b) 12 (c) 6 (d) -12
- ③ mohammed bought 510 pounds for item after discount.
 it's rate 15%, then original price = ----
 (a) 690 (b) 420 (c) 600 (d) 510

(B) IF $\frac{a-b}{a+b} = \frac{c-d}{c+d}$, prove that:

A, B, C, D are proportional quantities.

[Q3] (A) IF a, b, c, d are in continued proportion.

prove that: $\frac{a^2 - 3c^2}{b^2 - 3d^2} = \frac{b}{d}$

(b) Find Stand. dev for: 7, 12, 6, 15, 10

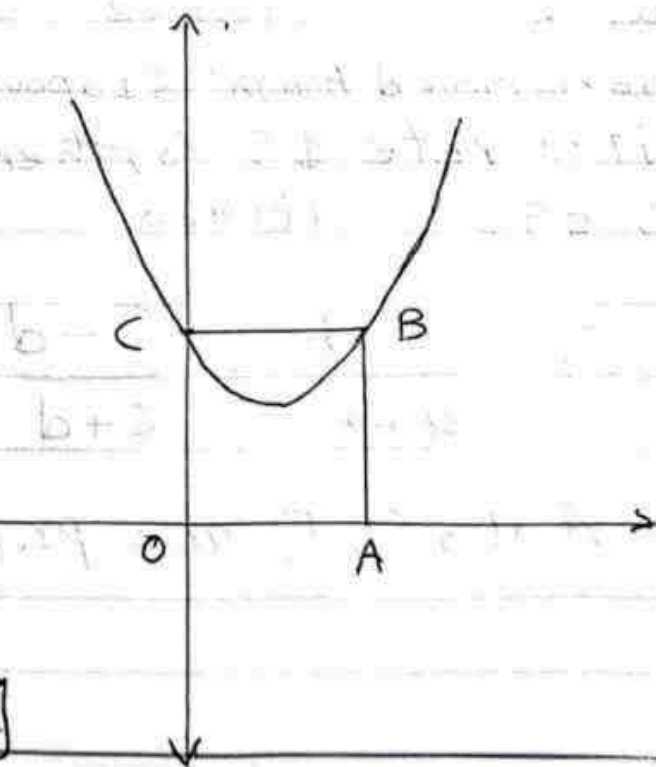
[Q4] (A) IF $x = \{-1, 1, 2\}$, $y = \{-1, 1, 4, 8\}$
 R is a relation from x to y means " $a = \sqrt[3]{b}$ "
 $a \in x$, $b \in y$. write R and soon---

(b) IF the volume of cylinder varies directly with square of length of radius of its base and varies directly with height, IF Volume 2540 cm^3
 $r = 7 \text{ cm}$, $h = 10 \text{ cm}$, Find Volume when
 $r = 4 \text{ cm}$, $h = 7 \text{ cm}$

[Q5] (a) IF: $x^2 + 9y^2 = 6xy$. find: $x:y$
 then find: $\frac{x^2 - 3xy}{5xy - 1}$

(b) in the opposite figure:
 represents curve of
 quadratic function
 $f(x) = x^2 - (k-2)x - k + 4$

ABCO square
 find: value of k



Q1: (A) choose

① $X \times Y = \{(1, 2), (3, 2)\}$ then $(1, 3) \in$ -----(a) $Y \times X$ (b) $X \times X$ (c) $X \times Y$ (d) $Y \times Y$ ② $f(x) = x^{a+b} + (a+2)x^5 + 8$ from 4th degree, $b =$ -----

(a) 5 (b) 6 (c) 2 (d) 4

③ S.S for equation: $(x-5)^0 = 1$ in R is -----(a) $\{5\}$ (b) $\{5, -5\}$ (c) R (d) $R - \{5\}$ (b) IF $5a - 3b = 0$, Find Value: $\frac{7a+9b}{4a+6b}$

Q2 (A) choose:

① IF $\frac{a}{b} = \frac{3}{5}$, $5a - 2b = 20$, $b =$ -----

(a) 3 (b) 5 (c) 20 (d) 25

② Range for values $\frac{2}{3}, \frac{4}{6}, \frac{10}{15}, \frac{14}{21}$ is -----(a) $\frac{1}{2}$ (b) 1 (c) 2 (d) zero③ IF $n(A \cup B) = 7$, then $n(a) \neq$ -----

(a) 5 (b) 6 (c) 7 (d) 8

(b) IF N is Natural numbers, $a R b$ means $a \times b = 12$ for $a, b \in N$, write R . IF $a R 3$ find value of a .

Q3 (a)

IF $\frac{x+y}{7} = \frac{y+z}{5} = \frac{z+x}{8}$ find: $x : y : z$

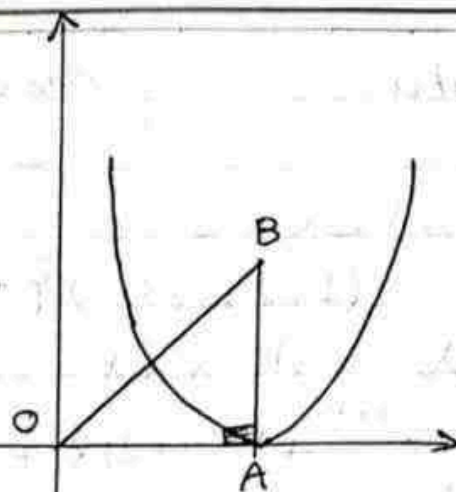
(b) the opposite figure represents

$$f(x) = x^2 - 8x + K$$

A of $\triangle ABO = 8\sqrt{3}$ Square unit

Find: (1) value of K

(2) rule of function that represents \vec{AO}



(Q4) (A) IF b is a middle proportional between a, c

$$\text{prove that: } \frac{c^2 - 3b^2}{b^2 - 3a^2} = \frac{c}{a}$$

(B) IF $y \propto \frac{1}{x^2}$, $y = 1$ when $x = 2$ Find

(1) relation between x, y, y when $x = 3$.

(Q5) represent graphically curve of function

$$f(x) = (x-3)^2 \quad x \in [0, 6] \text{ then find:}$$

① vertex of curve ② equation of symmetry

③ minimum or maximum value

(b) Find Stand. dev For values

12, 13, 16, 18, 21



Q1 (A) choose:-

① If $2 \sin 3x = \text{slope of S.L}$ which makes angle 45° with positive direction of x-axis, then $x = \dots$

- (a) 30 (b) 20 (c) 60 (d) 10

② If S.L $y = (2a+3)x + 4$ parallel to S.L

$x - 2y + 7 = 0$, then $a = \dots$

- (a) $\frac{3}{2}$ (b) $-\frac{5}{4}$ (c) $\frac{5}{2}$ (d) $-\frac{1}{2}$

③ In $\triangle ABC$, $AB = AC \neq BC$, then the number of axes of symmetry for this triangle = \dots

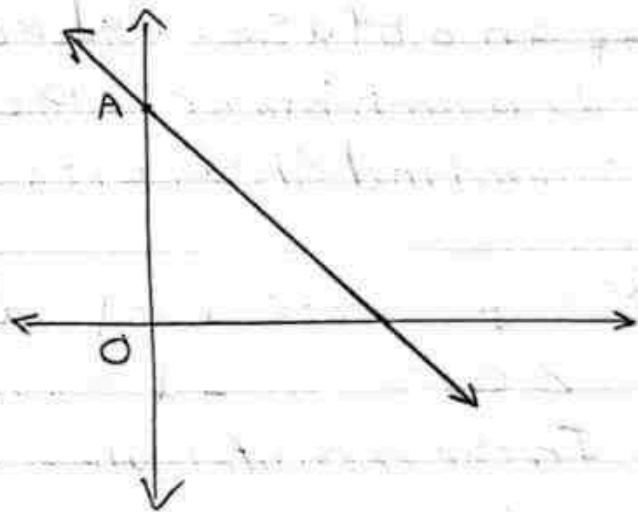
- (a) 1 (b) 2 (c) 3 (d) zero

(B) In the opposite figure:-

\overleftrightarrow{AB} cuts x-axis at point A and y-axis at point B

$AB = 5 \text{ cm}$, $OB = 3 \text{ cm}$

Find: equation of \overleftrightarrow{AB}



Q2 (A) choose

① a Square of diagonal length 6 cm , then Area = \dots

- (a) 36 (b) 9 (c) 18 (d) 72

② distance between $(-3, -4)$ and origin point = \dots

- (a) 3 (b) 4 (c) 7 (d) 5

③ If $\sin x = \cos (x+40)$ then $x = \dots$

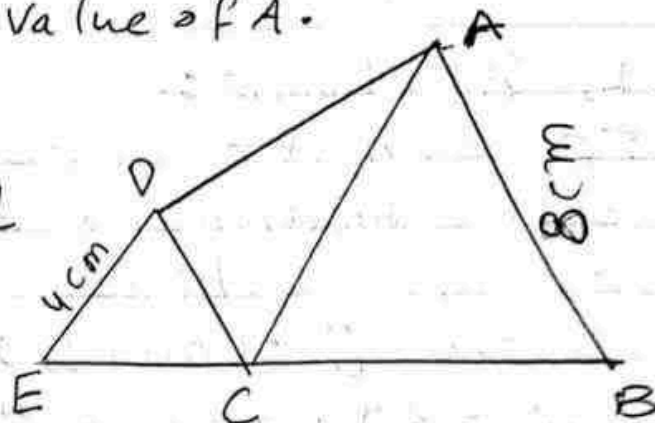
- (a) 50 (b) 25 (c) 20 (d) 60

(B) without using Calc. find x : $x < 90^\circ$

$$\sqrt{3} \tan x = \sin 30 \cos 60 + \cos 30 \sin 60$$

[Q3] (A) If the distance between $(a, 7)$, $(-2, 3)$ is 5 length units. Find value of a .

(B) in the opposite figure:
 $C \in BE$, $\triangle ABC$ equilateral
 $\triangle DCE$ equilateral triangle
 Find: $\sin(\angle CAD)$



[Q4] (A) Find equation of S.L that passes through $(-4, 3)$ and parallel S.L which equation $2x - y + 5 = 0$

(B) prove that:-

$A(5, 3)$, $B(3, -2)$, $C(-2, -4)$ is vertices of an obtuse-angled triangle then find D which make $ABCD$ is rhombus then find Area of its surface.

[Q5] (A) without using Calc prove that:

$$2 \cos^2 30^\circ - 1 = \cos 60^\circ$$

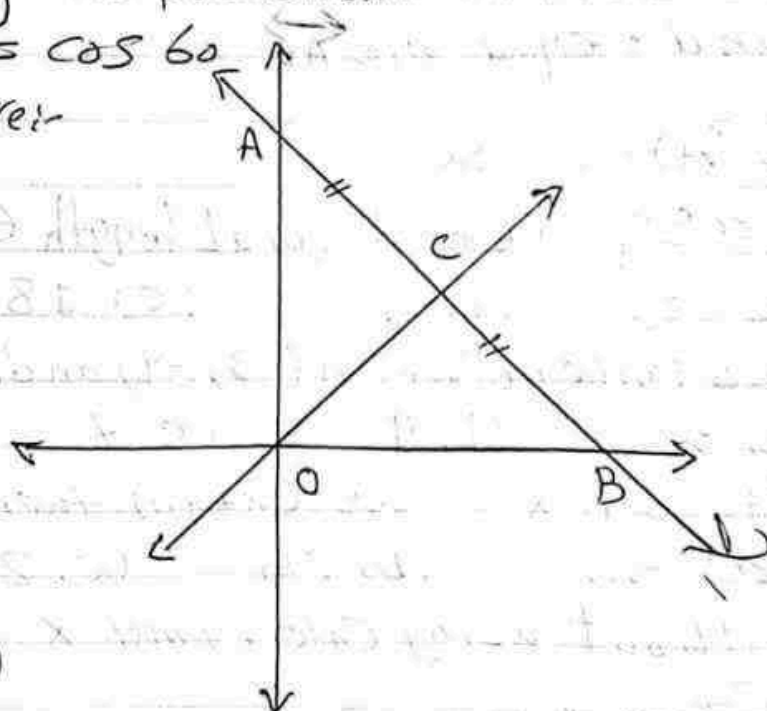
(B) In the opposite figure:-

$$OA = 6 \text{ L.U.}$$

$$OC = 5 \text{ L.U.}$$

C is mid point \overline{AB}

Find: equation of \overleftrightarrow{OC}



Geometry Model 2 Math inspection

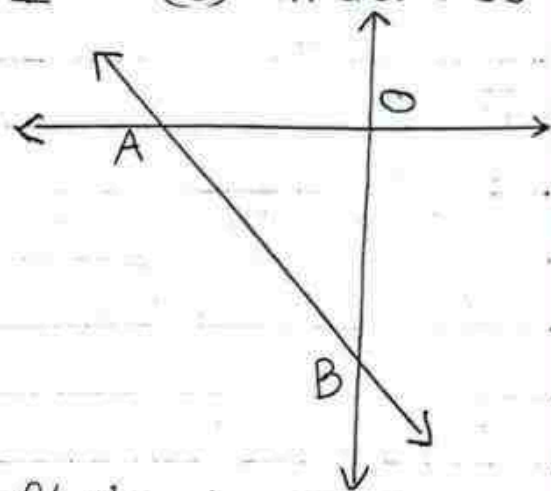
Q1 (A) choose

① IF $\sin(x+15) = \frac{\sqrt{3}}{2}$, then $\tan(x-15) = \dots$
 (a) $\frac{\sqrt{3}}{2}$ (b) $\frac{\sqrt{3}}{3}$ (c) $\frac{1}{2}$ (d) 1

② IF C is a midpoint of \overline{AB} : A (-2, -3), C (2, 1)
 then B =

(A) (6, -5) (b) (-6, 5) (c) (6, 5) (d) (5, 6)

③ IF $\vec{AB} \perp \vec{CD}$, slope of $\vec{AB} = \text{zero}$, slope of $\vec{CD} = \dots$
 (a) -1 (b) zero (c) 1 (d) undefined.



[B] in the opposite figure:

IF $3OA = 4OB$

$AB = 10 \text{ cm}$

Find: equation of \vec{AB}

Q2 (A) choose

① the image of point (-3, 2) by reflection in O is
 (a) (3, -2) (b) (3, 2) (c) (-3, -2) (d) (-3, 2)

② IF the ratio between two supplementary angles 2:3
 then measure of greater angle =
 (a) 18° (b) 36° (c) 72° (d) 108°

③ the point lies on straight line passes through points (2, 3), (4, 4).

(a) (1, 1) (b) (4, 2) (c) (6, 5) (d) (3, 6)

[B] prove that: points A(3, -1), B(-4, 6), C(2, -2)
 lies on a circle its centre M(-1, 2). then find
 Area of circle in term of π .

[Q3] (A) If X is an acute angle,
 $\cos X \tan X = \frac{1}{3}$ find value of X

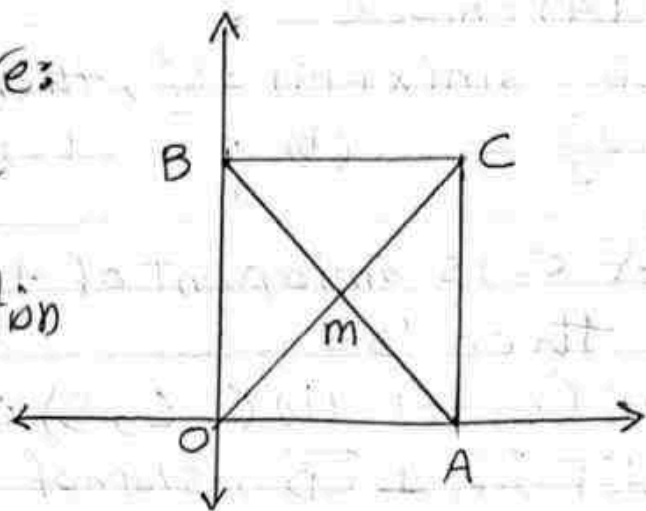
(B) In the opposite figure:

$AOBC$ is a square

Area of $\square = 16 \text{ cm}^2$

m is point of intersection
of diagonals

Find: equation of \vec{MC}

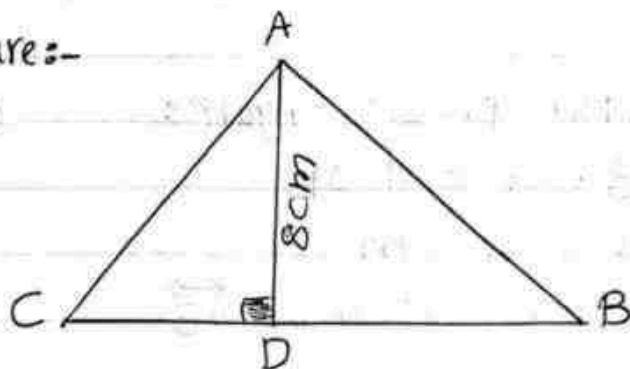


[Q4] (A) In the opposite figure:-

$AD \perp BC$, $AD = 8 \text{ cm}$

$$\text{If: } \frac{1}{\tan B} + \frac{1}{\tan C} = \frac{3}{2}$$

Find: length of \overline{BC}



(B) Find equation of S.L that passes through point
 $(-2, 5)$ and perpendicular on S.L: $x - 2y = 4$

[Q5] (A) without using Calc:

$$\sin^2 30 = 9 \cos^2 60 - \tan^2 45$$

(B) In the opposite figure:

$OA = 8 \text{ L.U}$, $OB = 6 \text{ L.U}$

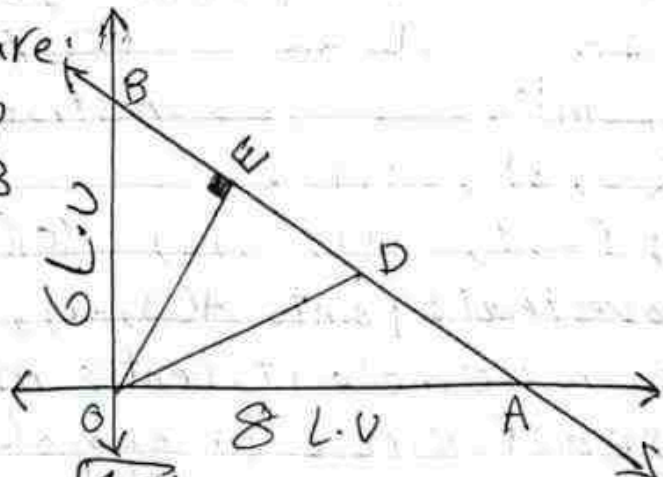
\overline{OD} is median in $\triangle OAB$

Find:

① slope of \vec{AB} , \vec{OE}

② point D

③ length of \overline{DE}



Q1 (A) choose:-

① If the point $(-K, -2K)$ lies on S.L $3x + y = 5$
then $K =$

- (a) -2 (b) 1 (c) 2 (d) -1

② distance of point $(-5, 4)$ and y -axis =

- (a) -5 (b) 4 (c) 5 (d) 3

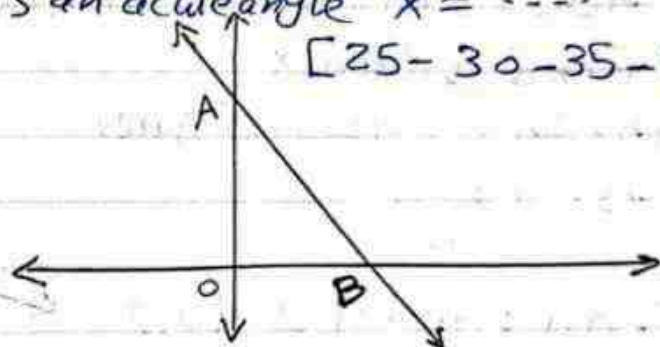
③ If $\sin(x+5) = \frac{1}{2}$, x is an acute angle $x =$

(B) in the opposite figure:

$A(0, 4)$

Area of $\triangle OAB = 6$ S.U

Find: equation of \overleftrightarrow{AB}



Q2 (A) choose

① ABCD is a rhombus in which: $A(-5, 3)$, $C(2, -4)$.

then slope of $\overleftrightarrow{BD} =$

- (a) 1 (b) -1 (c) $\frac{1}{7}$ (d) $-\frac{1}{7}$

② $\sqrt{2} \cos 45 \sin 60 =$

- (a) $\cos 30$ (b) $\tan 30$ (c) $\sin 30$ (d) $2 \sin 30$

③ equation of S.L that passes through $(5, 3)$ and parallel to x -axis is

- (a) $y = 5$ (b) $x = 5$ (c) $y = 3$ (d) $x = 3$

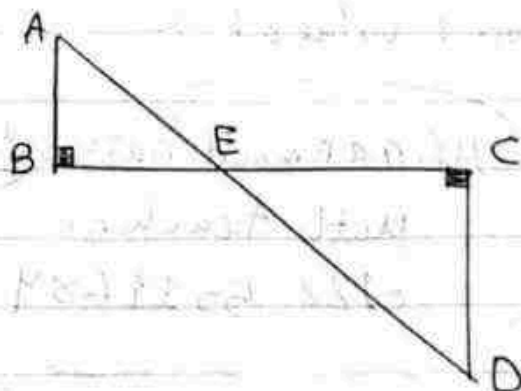
(B) In the opposite figure:

$\overleftrightarrow{AD} \cap \overleftrightarrow{BC} = \{E\}$

$BC = 5$ cm, $AB = 2$ cm

$CD = 4$ cm

Find: $(\tan D)^{-1}$



Q3 (A) IF ΔABC is right angled triangle at B.

$$3 \sin A + \cos C = 1$$

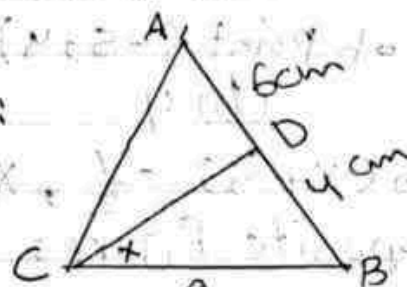
Find : $m(\angle A)$

(B) IF the distance between points $(x, 5)$, $(6, 1)$ $= 2\sqrt{5}$ Find values of x .

Q4 (A) In the opposite figure:

ABC is equilateral triangle

Find : $\tan x$

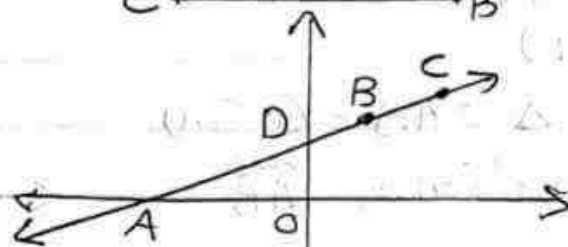


(B) In the opposite figure:

$B(1, 2)$

$C(3, 4)$

Find : Area of ΔAOD

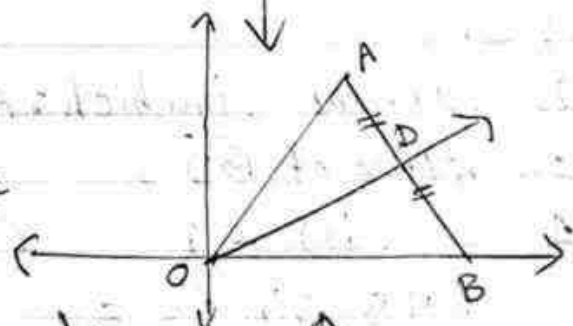


Q5 (A) in the opposite figure:-

ABC is equilateral triangle

OD is a median

Find : equation of \vec{OD}

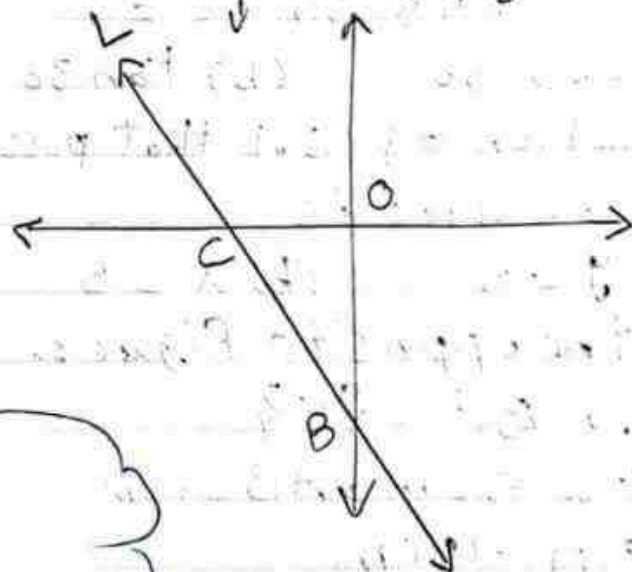


(B) in the opposite figure:-

$C(-2, 0)$, $B(0, -6)$

IF $A(K+3, K+1) \in L$

Find : Value of K



Geometry

Model 4

Math inspection

Q1 (A) choose

① the perpendicular distance between two lines

$$y - 3 = 0, y + 2 = 0 \text{ is } \dots\dots$$

- (a) 1 (b) 2 (c) 3 (d) 5

② If \overline{AB} is a diameter in circle: $A(3, -5), B(5, 1)$
the centre of circle is $\dots\dots$

- (a) $(4, 2)$ (b) $(8, -2)$ (c) $(4, -2)$ (d) $(2, 2)$

③ $\sin 30^\circ \cos^2 45^\circ + \cos 60^\circ = \dots\dots$

- (a) $\frac{1}{4}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

(B) prove that: point $A(1, 1), B(2, 3), C(0, -1)$
are collinear.

Q2 If $x + y = 5, kx + 2y = 0$ are parallel
then $k = \dots\dots$

- (a) -2 (b) -1 (c) 1 (d) 2

② If $\sin x = \frac{1}{2}$, x is an acute angle, then $\sin 2x = \dots\dots$

- (a) -2 (b) $\frac{1}{4}$ (c) $\frac{\sqrt{3}}{4}$ (d) $\sqrt{3}$

③ S.L which equation: $2x - \frac{2}{3}y - 6 = 0$ intercepts
from y -axis $\dots\dots$

- (a) -6 (b) -2 (c) 2 (d) $\frac{2}{3}$

[B] in the opposite figure:

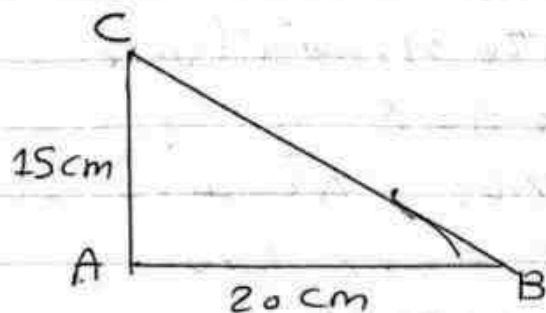
$\triangle ABC$ in which

$$AC = 15, BC = 20$$

$$m(\angle A) = 90^\circ$$

Prove that:-

$$\cos C \cos B - \sin C \sin B = \text{zero}$$



Q3 (A)

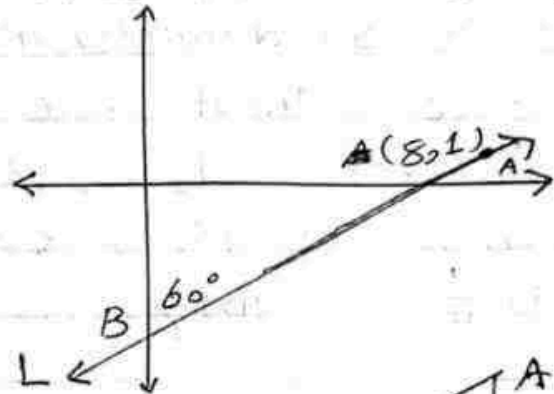
Because of wind, Top of a tree was broken makes with ground angle whose measure 60° . If the point of meeting tree ~~by base of~~ with ground is far about its base 6 m, Find length of tree, "to the nearest meter".

(B) In the opposite figure:

$$m(\angle B) = 60^\circ$$

$$A(8, 1) \in L$$

Find: equation of \overleftrightarrow{L}



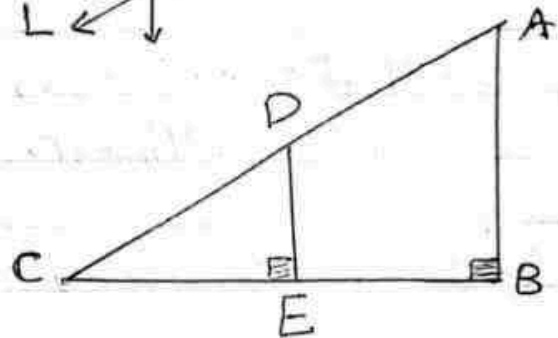
Q4 (A) in the opposite figure:-

$\triangle ABC$ Right at B

$$AB = 6 \text{ cm}, 4DE = 3EC$$

$$\overline{DE} \perp \overline{BC}$$

Find: A of $\triangle ABC$



(B) \overline{AB} is a diameter which centre $(5, 7)$, If $B(8, 10)$

Find: equation of perpendicular s.l on \overline{AB} at A.

Q5 (A) If $2\tan x = \tan^2 60^\circ - 2\sin 30^\circ$

Find $m(\angle x)$ without using calc

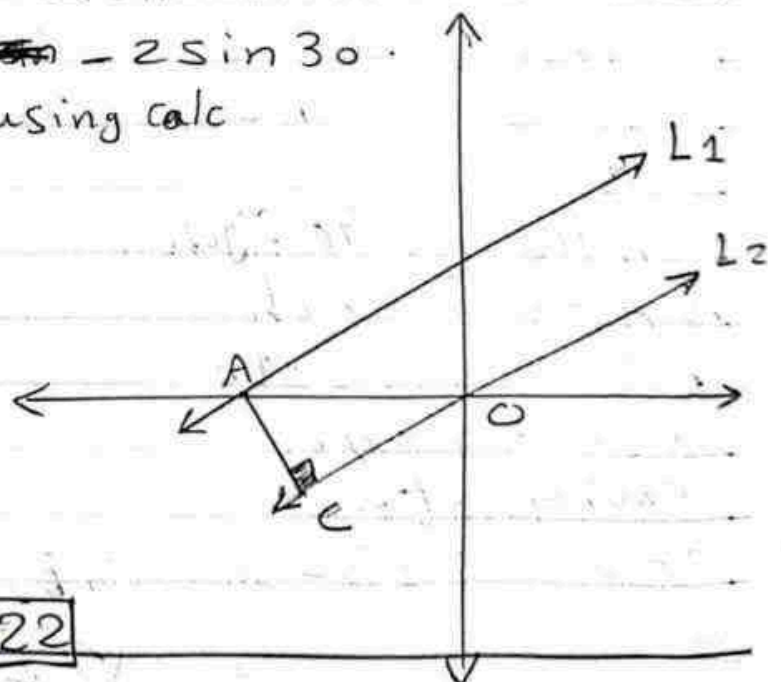
(B) in the opposite figure

$$L_2: y = x$$

$$L_1 \parallel L_2, \overline{AC} \perp \overleftrightarrow{L_1}$$

$$AC = 2\sqrt{2} \text{ L.U.}$$

Find: equation of L_1



Geometry

(Model 5)

(Math inspection)

Q1 (A) choose:-

① Image of point $(3, -4)$ by reflection in y -axis is

- (a) $(-3, -4)$ (b) $(-3, 4)$ (c) $(3, 4)$ (d) $(3, -4)$

② S.L passes $(-4, 3)$ and parallel y -axis, its equation is

- (a) $y = -4$ (b) $y = 3$ (c) $x = -4$ (d) $x = 3$

③ ΔXYZ is an acute angled triangle, $m(\angle Z) = 75^\circ$

$\cos y = \sin y$, then $m(\angle X) =$

- (a) 70 (b) 60 (c) 45 (d) 85

[B]

ΔABC in which: $A(3, -2)$, $B(5, -1)$, $C(1, 1)$

D is a midpoint of \overline{AB} , draw $\overline{DE} \parallel \overline{BC}$ and intersects \overline{AC} at E , find equation of \overline{DE}

Q2 (A) choose

① $\tan 45 + \sin 30 =$

- (a) 1 (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{3}{2}$ (d) $\frac{1}{2}$

② a square, its Area 18 cm^2 , then length of its diagonal =

- (a) 9 (b) 6 (c) 36 (d) 12

③ If m_1, m_2 two slopes of two straight Lines which are perpendicular, then

- (a) $m_1 = m_2$ (b) $m_1 = -m_2$ (c) $m_1 = -\frac{1}{m_2}$ (d) $m_1 \times m_2 = 1$

[B] $ABCD$ is a trapezium in which $\overline{AD} \parallel \overline{BC}$

$AD = 6 \text{ cm}$, $AB = 3 \text{ cm}$, $BC = 10 \text{ cm}$

$m(\angle B) = 90^\circ$

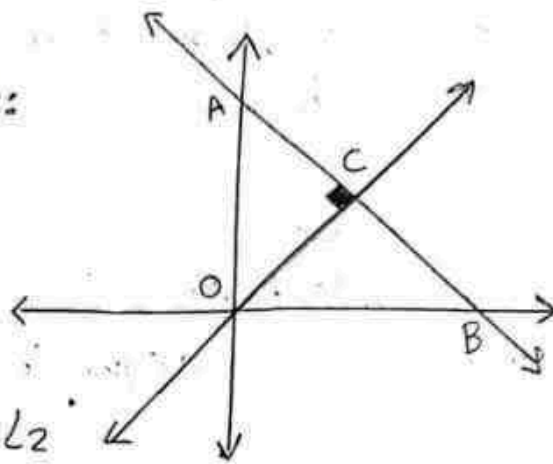
prove that: $\cos(\angle D(CB)) = \tan(\angle ACB) = \frac{1}{2}$

Q3 (A) If the points $A(-1, 3)$, $B(5, 1)$, $C(x, 4)$ are vertices of a right-angled triangle at B .
Find: Value of x .

(B) without using calculator: Find value of E where " E is an acute angle" IF
 $\tan(E + 5) = \sin 30^\circ \cos 60^\circ + \cos^2 30^\circ \tan 45^\circ$.

Q4 (A) in the opposite figure:

$\vec{OC} \perp \vec{AB}$, $C(2, 2)$
Find: equation of \vec{AB}



(B) IF two equations L_1, L_2

$$L_1: x - 4y - 3 = 0$$

$$L_2: y = (k-1)x + 5$$

Find: value of k IF L_1, L_2 ① parallel ② perpendicular

Q5 (A) $\triangle ABC$ is right-angled at B .
prove that: $\sin A + \sin C > 1$

(B) In the opposite figure:

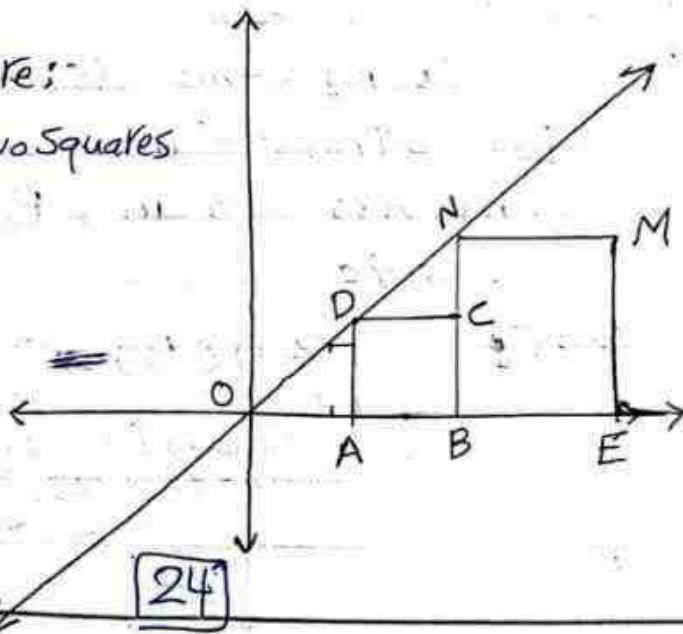
$ABCD, EBNM$ are two squares.

where $m(8, 4)$

Find:

(1) equation of \vec{ND}

(2) coordinates of D



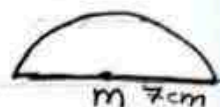
Q1 (A) choose:-

(1) ABC is right angled triangle at B, $3AC = 5BC$,
 $\tan A = \dots$

- (a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) $\frac{3}{4}$ (d) $\frac{1}{3}$

(2) the opposite figure represents a semicircle, its radius
 7 cm, then perimeter of figure = cm

- (a) 44 (b) 29 (c) 36 (d) 22



(3) ABCD is a rhombus in which: $m(\angle B) + m(\angle D) = 200^\circ$
 then $m(\angle BAC) = \dots$

- (a) 40 (b) 50 (c) 80 (d) 100

(B) Find equation of S.L which slope = $\frac{2}{3}$ and
 passes through $(-3, 1)$.

Q2 (A) choose:-

(1) two straight lines in which their slopes $\frac{3}{2}$, $\frac{k}{6}$ are parallel
 then $k = \dots$

- (a) 6 (b) 4 (c) $\frac{3}{2}$ (d) 9

(2) $\triangle DEO$ is right at O, $\tan D = 1$ then

- (a) $m(\angle D) = m(\angle O)$ (b) $m(\angle E) = m(\angle O)$
 (c) $DO = DE$ (d) $DO = OE$

(3) In $\triangle DEO$ Right at E, which of the following is mistake

- (a) $\tan D \times \tan O = 1$ (b) $\sin D = \cos O$
 (c) $\cos D = \sin O$ (d) $\cos D = \sin E$

[B] If axis of symmetry of \overline{CD} , passes through
 $A(6, m)$ where $C(3, 1)$, $D(-3, 7)$

Find: value of m .

[Q3] (A) A ladder \overline{AB} of length 8m lies on a ground with angle 65° on B. and other edge A lies on a vertical wall, If O is projection of A on the ground. Find to the meter length of \overline{OB} , \overline{OA}

(B) ABCD is a rectangle in which: $A(5,1)$; $B(1,5)$
 $C(-1,3)$ Find D, then find Area of rectangle.

[Q4] (A) Find equation of S.L passes through $(-5,3)$ and parallel to S.L: $3y = 2 - x$

(B) If y is measure of an acute angle:

$$\sin y \sin^2 45 = \frac{\tan^2 45 \cos^2 60}{\tan 60}$$

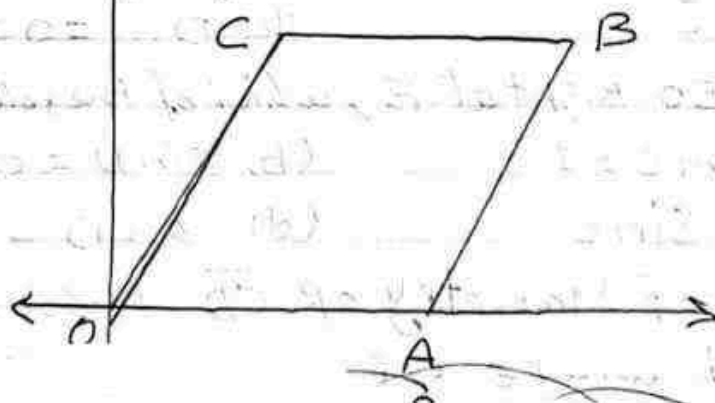
[Q5] (A) $\triangle ABC$ is right at B

$$7 \tan - 24 = 0$$

Find the value of: $1 - \tan A \tan C$

(B) In the opposite figure:-

OABC is a parallelogram, If $A(6,0)$, $C(3,4)$
 Find: length \overline{OB} , equation \overleftrightarrow{OB} .



Geometry

model 7

Math inspection

Q1 (A) choose:-

(1) S.L which equation: $2x + 5y = 10$, intercepts from x-axis part. 1.0.

(a) 2 (b) 5 (c) -5 (d) -2

(2) If $\tan 3x = \sqrt{3}$, where $3x$ is acute $\Rightarrow x = \dots$

(a) 20 (b) 30 (c) 10 (d) 45

(3) If two complementary angles are congruent, then measure of each one =

(a) 90 (b) 50 (c) 40 (d) 45

[B] prove that: points $A(3, -1), B(-4, 6)$ passes through a circle its centre $m(-1, 2)$

Find circumference of circle.

Q2 (A) choose:

(1) the image of point $(2, -3)$ by reflection in x-axis is

(a) $(2, 3)$ (b) $(-2, 3)$ (c) $(3, 2)$ (d) $(-3, 2)$

(2) two straight lines which their slopes $\frac{3}{2}, \frac{k}{6}$ are perpendicular. then $k = \dots$

(a) 6 (b) -4 (c) 4 (d) 9

(3) If $C(6, -4)$ is midpoint of \overline{AB} , $A(5, -3)$ then $B = \dots$

(a) $(7, -5)$ (b) $(5, 7)$ (c) $(-5, 7)$ (d) $(-7, 5)$

[B] Find equation of S.L that passes through $(1, 4)$ and makes a positive angle with 45° with the positive direction of x-axis.

Q3 (A) without using calc find value of h
 $\tan(h+5) = \sin 30 \cos 60 + \cos^2 30$

(B) In the opposite figure:-

$A(3,5)$, $OB=6$ L.U

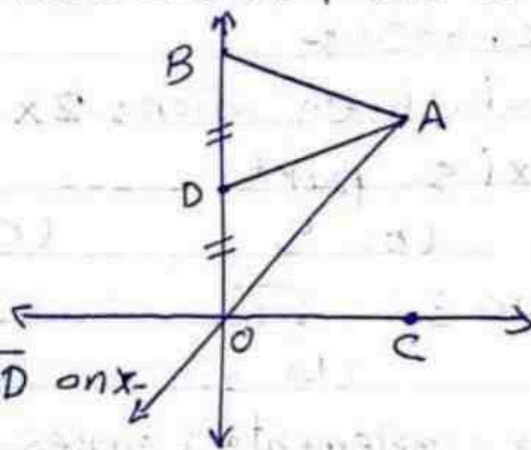
\overline{AD} is median in $\triangle AOB$

Find:-

\Rightarrow length \overline{AD}

\Rightarrow measure of angle slope of \overline{AD} on x-

$\Rightarrow m(\angle AOC)$

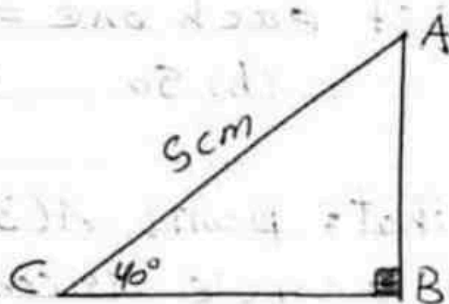


Q4 (A) in the opposite figure:-

$AC=5\text{cm}$, $m(\angle C)=40^\circ$

Find:

Length of \overline{AB} , \overline{BC}



(B) Find equation of S.L that passes through $(3,5)$
 and perpendicular on S.L: $3x - y = 2$

Q5 (A) without using calc; prove that

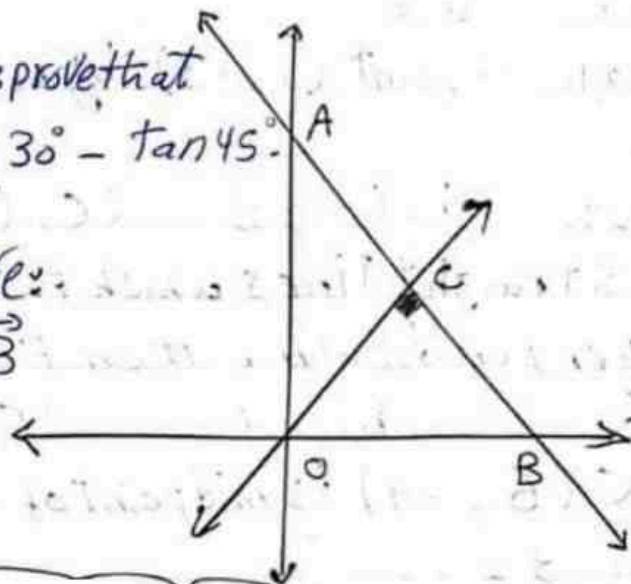
$$\cos 60^\circ = 2 \cos 30^\circ - \tan 45^\circ$$

(B) In the opposite figure:-

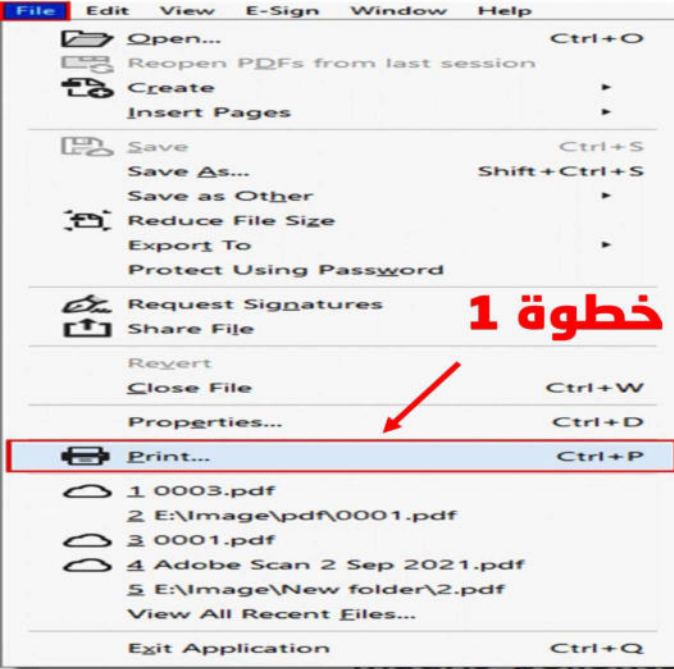
$C(2,3)$, $\overline{OC} \perp \overline{AB}$

Find:

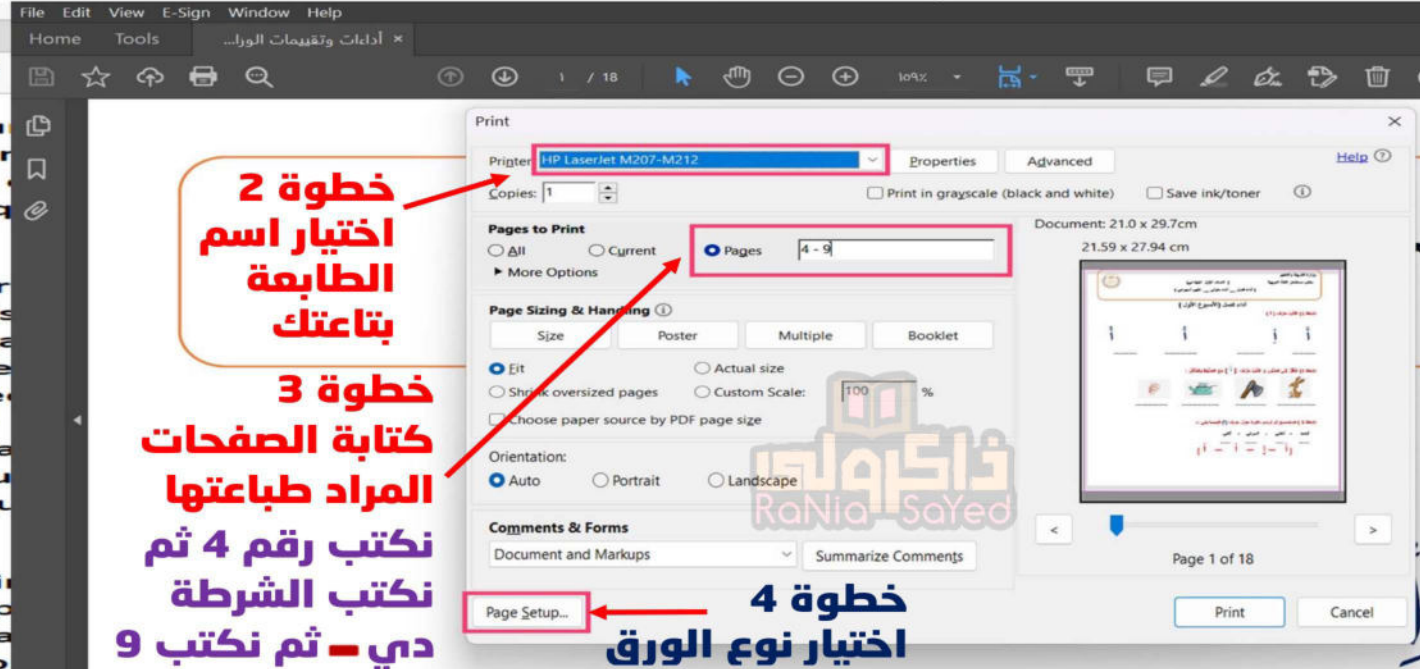
equation of \overline{AB}



كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



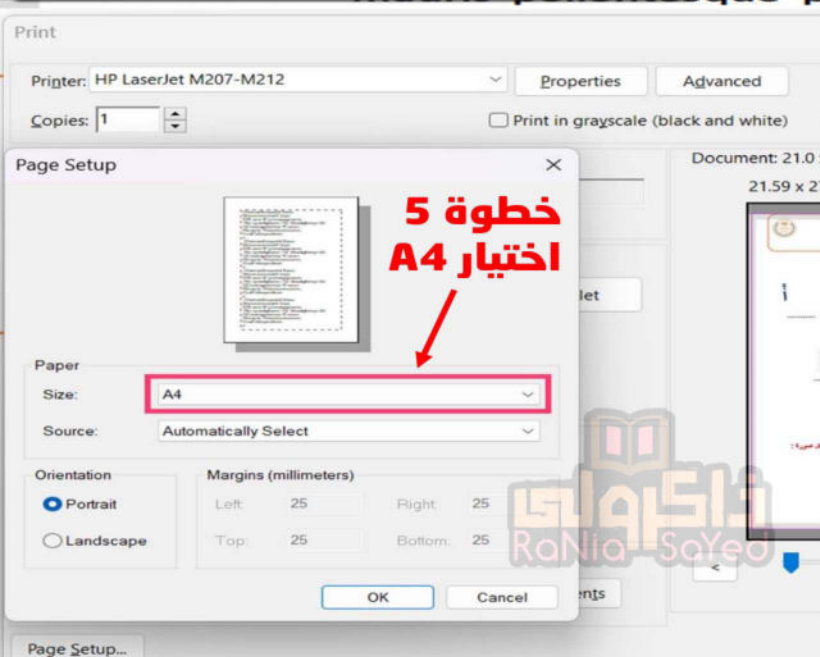
خطوة 1



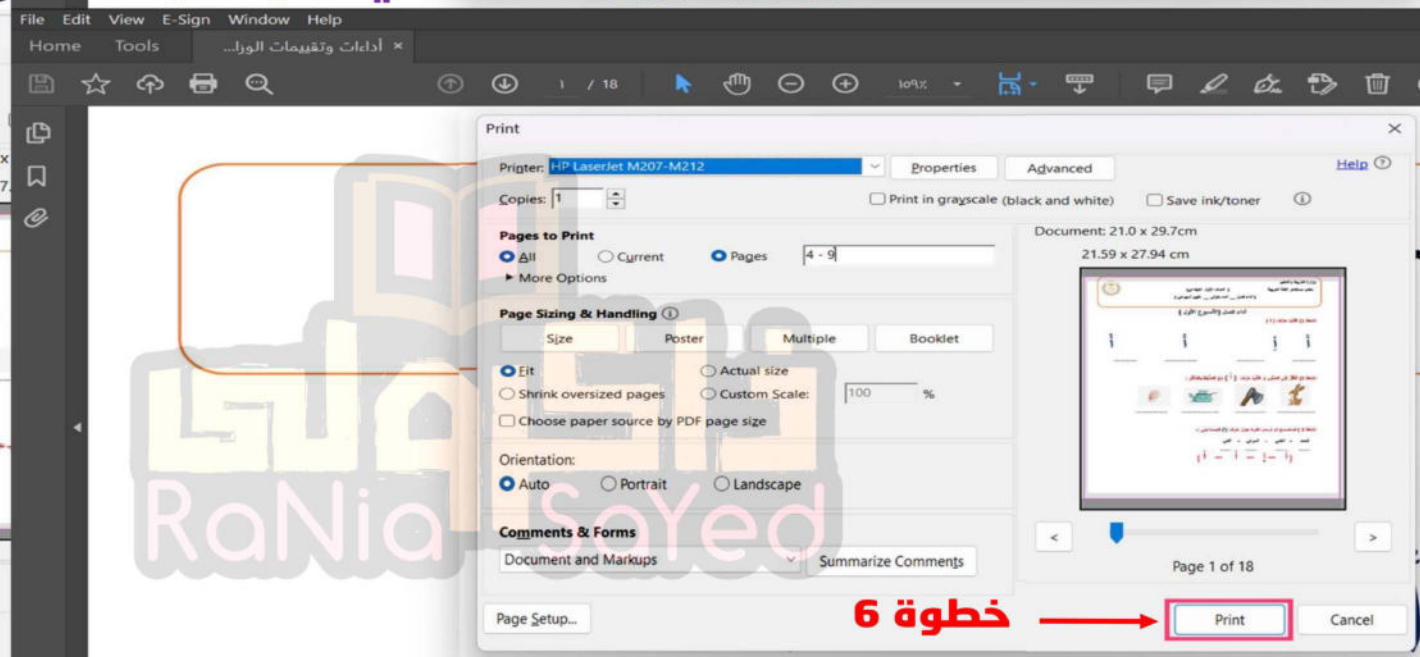
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6